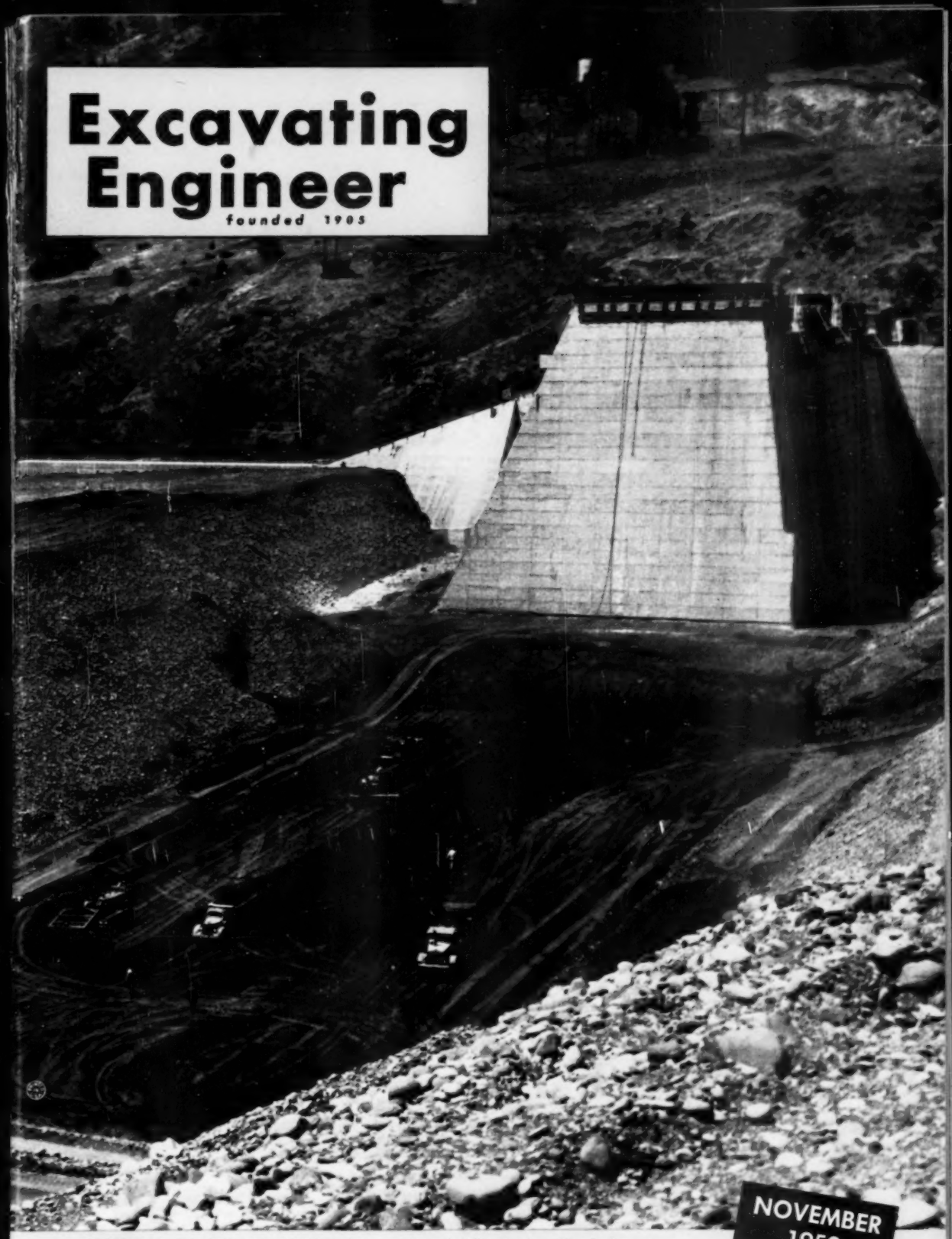
Excavating Engineer

founded 1905



NOVEMBER 1952

LOOKOUT POINT DAM SPILLWAY CONCRETE rises across Oregon's Willamette river. Short haul season caused impervious clay core fill to lag behind pervious fill. Here, machines of six joint venturers bring up core in compacted lifts. See article on page 12.

How Bucyrus-Erie Drills Give You

Extra DRILLING FOOTAGE ...EVERY SHIFT

FAST-working Bucyrus-Erie Blast Hole Drills deliver P-O-W-E-R at the point of impact that pushes holes down fast. Here's what makes that power add up.

Rapid, Even Drilling Rhythm Bucyrus-Erie drills travel at the rate of between 55 and 58 evenly spaced strokes per minute. This fast, even stroke coupled with the sharp hit-and-snap-up action provided by the derrick head shock absorbers shatters rock in a hurry.

Long Stroke Bucyrus-Erie drills match smooth drilling motion with a long stroke. (46-in. maximum for 42-T, 44-in. for 29-T, 40-in. for 27-T, 36-in. for 22-T.) It's this long stroke that multiplies the impact of the tool string.

Tool Strings of Maximum Weight Bucyrus-Erie drills can handle extra tool strings because these rigs combine strong, rigid steel construction with plentiful reserve power. Add heavy tool strings to fast, sharp action and a long stroke and you have the answer to Bucyrus-Erie's leadership in high-speed, low-cost hole footage.

126852

There are many additional reasons why Bucyrus-Erie's are the Big Four of blast hole drilling. Write for full details.

22-T	5⅞"	to 6⅝" holes
27-T	6"	to 6⅝" holes
29-T	6"	to 9" holes
42-T	9"	to 12" holes

Diesel or electric power is available for all machines, gasoline for all except 42-T.

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

PROGRESS IN EXPLOSIVES . . .

FOR WORKING UNDER PRESSURE

Hercules' research has developed explosives that shoot successfully even under the severe water pressures encountered today in seismograph prospecting.

In the laboratory test shown here, a cartridge of Hercules Vibrogel® 3 is sealed in the steel "bomb" at the extreme left. It then undergoes prolonged exposure to pressures greater than those ordinarily found in actual field use. Because Vibrogel 3 embodies a new conception of explosives research, it detonates despite these extreme conditions.

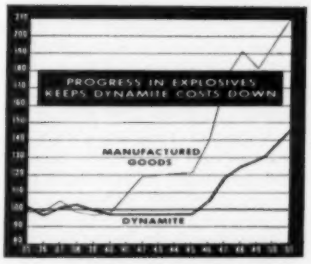


Chart shows relative stability of dynamite prices since 1935, as compared with prices of other manufactured goods. 1935-39 values=100.

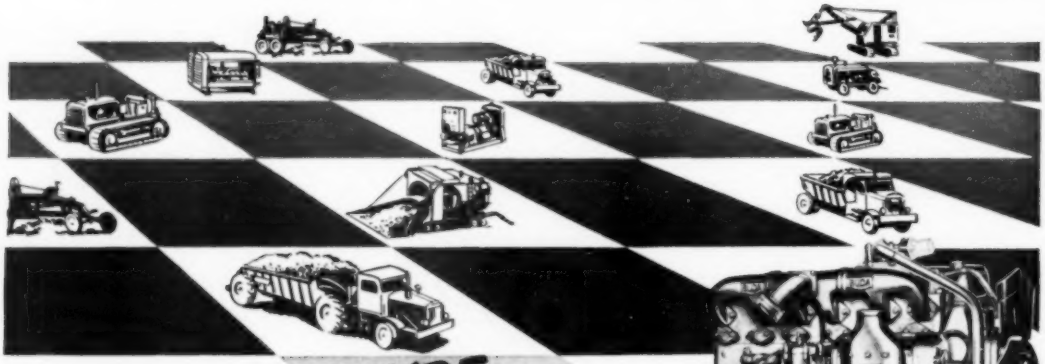
HERCULES POWDER COMPANY

INCORPORATED

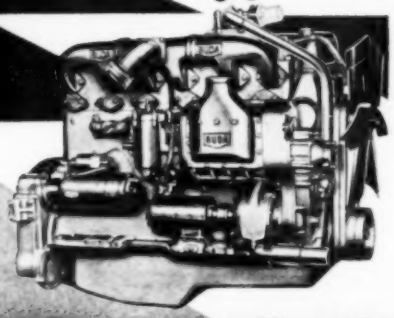
Explosives Department, 972 King St., Wilmington 99, Del.

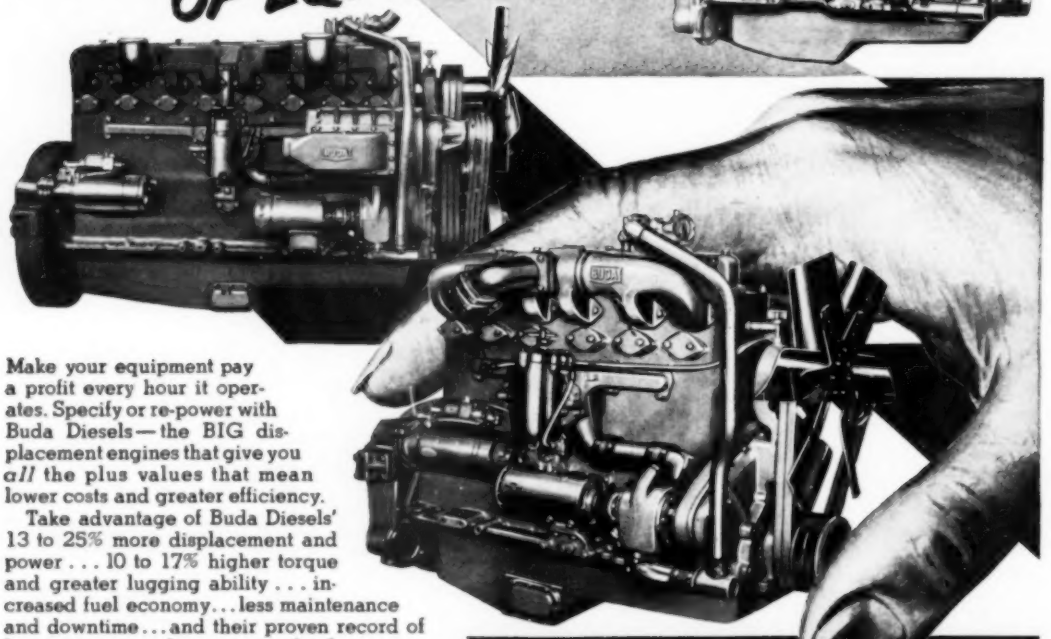
X852-7

the smart move is to Buda Diesels



FOR EVERY TYPE OF EQUIPMENT





Make your equipment pay a profit every hour it operates. Specify or re-power with Buda Diesels — the BIG displacement engines that give you *all* the plus values that mean lower costs and greater efficiency.

Take advantage of Buda Diesels' 13 to 25% more displacement and power . . . 10 to 17% higher torque and greater lugging ability . . . increased fuel economy . . . less maintenance and downtime . . . and their proven record of longer operation between overhauls.

Your nearby Buda Engine Distributor can prove the money-making advantages of Buda Diesels in your equipment. Ask him today. Write for Bulletins and data. *THE BUDA COMPANY, Harvey, Illinois.*

a Power-Full and Dependable Name in Engines...

BUDA

BC-20

Manufacturers of Diesel and Gasoline Engines, Maintenance of Way Products, Lifting Jacks, Earth Drills and Material Handling Equipment

Advertisers

IN THIS ISSUE

American Chain & Cable Co. 10
American Hoist & Derrick Co. 58
American Manganese Steel Div., American Brake Shoe Co. 11
American Steel Dredge Co., Inc. 45

Bethlehem Steel Co. 8
Boydell, E., & Co., Ltd. 34
Briggs & Stratton Corp. 48
Broderick & Bascom Rope Co. .... 4th Cover
Bucyrus-Erie Co. .....2nd Cover, 6, 9, 42-43, 49, 59, 62
Buda Co., The 2

Caterpillar Tractor Co. 28-29
Cooper-Bessemer Corp., The 7

Detroit Diesel Engine Div., General Motors Corp. 39
Drake-Williams-Mount 44

Easton Car & Construction Co. 57
Ensign-Bickford Co., The .....3rd Cover
Erie Steel Construction Co. 30
Euclid Road Machinery Co., The 53

For Sale (Classified) 63

General Motors Corp., Detroit Diesel Engine Div. 39

Harnischfeger Corp. 55
Hayward Co., The 38
Hercules Powder Co. 1
Hough Co., The Frank G. 40

International Harvester Co. 32-33

Jaeger Machine Co., The 45

Koehring Co. 46-47

LaCrosse Trailer Corp. 31
LeTourneau, R. G., Inc. 36-37

M-R-S Manufacturing Company 24-25

Newman Manufacturing Co. 60
Northwest Engineering Co. 5

Owen Bucket Co., The 41

Phoenix Products Co. 54

Rogers Bros. Corp. 51

Salem Tool Co., The 50
Sauerman Bros., Inc. 61

Wellman Engineering Co., The 52

Excavating Engineer

founded 1905

CONTENTS

Volume XLVI No. 11 **November, 1952**

Highball Dirt at Lookout Point — by Ray Day 12
Two-zone fill comes up rapidly as contractors shape new dam to muzzle the Willamette.

England's Iron Crescent — by Edmund Updale 18
Running through the center of England is a crescent shaped iron ore system which is considered the most important in the United Kingdom. The Iron Crescent is about 150 miles long and up to 60 miles wide. The 14 million ton yield is needed more than ever today in export-short Britain.

Navy Trains Shovelrunners 30
Recruits with little or no experience are made into apprentice construction men by the Navy Seabees.

News from the Field 35
New British Diesels Seek U. S. Markets 35
Underground Gas Storage Approved in Illinois 35
Ocean-Going Ore Fleet Expanding Rapidly 35
U. S. Firms Reconstruct War-Ravaged Mine 38
Lavers Joins Ebasco 38
Name Pittsburgh Man to Head Mine Safety Work 38
Goodyear Cuts Prices 41

Equipment You Ought to Know About 44

New Trade Literature 52

Not in the Contract 56

Notes from the Manufacturers 60

COPYRIGHT 1952 BY THE EXCAVATING ENGINEER PUBLISHING COMPANY

Regular Subscription (payable in advance): 35 cents per copy, $3.50 a year; Canada and foreign, subject to publication policy, $5.00 per year. Special subscription: Upon written request on company letterhead this publication will be sent free of charge to companies, executives and supervisors engaged actively in excavating. Occupation of subscriber must be given for all subscriptions, paid or special. Right is reserved to refuse foreign subscription. Indexed by Engineering Index, Inc. Volumes available on microfilm.

Published Monthly by

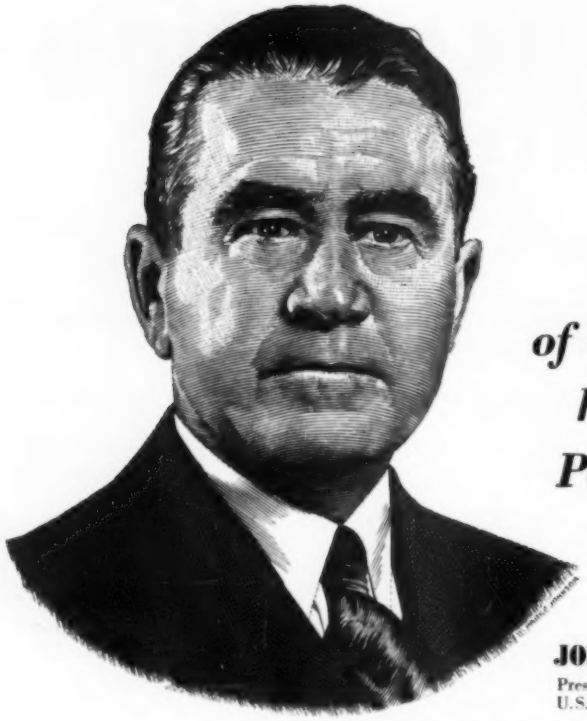
THE EXCAVATING ENGINEER PUBLISHING COMPANY

South Milwaukee, Wisconsin, U.S.A.

E. M. HEUSTON, Publisher
W. C. VAN DYKE, Editor
M. B. JAEGER, Managing Editor

H. A. BURKHARDT, Sales Manager
E. W. ARNDT, Art Editor
E. R. KRYMKOWSKI, Assistant Editor

CCA Member Controlled Circulation Audit



"More than 98% of our 27,000 employees have enrolled in the Payroll Savings Plan"

JOHN E. GOBLE
President, National Tube Division,
U.S. Steel Corporation

"We of the National Tube Division of the United States Steel, recognize that systematic saving through the Payroll Deduction Plan is an investment in the security of the Nation, as well as of the individual. We are proud of the participation resulting from a person-to-person canvass in our plants and offices. More than 98% of our 27,000 employees have enrolled in the Payroll Savings Plan—a complete affirmation of their faith in America. Such personal savings are the backbone of our free enterprise system."

Concisely, clearly, Mr. Goble cites three of the reasons why 98% of the 27,000 employees of National Tube are enrolled in the Payroll Savings Plan:

- recognition by management that the Payroll Savings Plan contributes "to the security of the Nation as well as of the individual."
- the purchase of Defense Bonds through payroll deductions is concrete affirmation of Americans' faith in America.
- a person-to-person canvass in plants and offices put a Payroll Savings application in the hands of every National Tube employee.

There is still another reason for National Tube's outstanding employee participation: *Mr. Goble's personal interest in the Payroll Savings Plan, and the conducting of the person-to-person canvass.*

State Directors of the Treasury Department, members of the Field Staff of the Payroll Savings Division, Volunteer Chairmen of industry groups—everyone associated with the Payroll Savings Plan—will tell you that every highly successful Payroll Plan is a reflection of the deep interest and personal effort of the company's top executive.

If you are the man who makes the top decisions in your company, ask today for a report of *your* Payroll Savings Plan, particularly, the percentage of participation. Then, call a meeting of your associates. Show them this statement of Mr. Goble's. Tell them you are going "all out" to put your company (large or small) in the front rank of those who can be justly proud of their Payroll Savings Plan.

A phone call, wire or letter to Savings Bond Division, U.S. Treasury Department, Suite 700, Washington Building, Washington, D.C., will bring prompt cooperation from your State Director.

If you are not the chief executive of your company, please tear out this page and send it to the "Big Boss" with your recommendation.

The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

WHY THE LIFE EXPECTANCY OF YOUR NORTHWEST IS GREATER!

The design and performance of Northwest equipment has been proved in years of service. One out of every three Northwests sold is a repeat order!

There is one particular Northwest policy that should interest every prospective Shovel, Crane, Dragline and Pullshovel buyer and that is the Northwest program of continuous and tested improvement *with you as a Northwest owner in mind.*

The development of mechanical improvements for better performance on new equipment doesn't always permit their installation on old rigs. But here at Northwest, *every new improvement* is entered upon with the idea of making the new modern advantages and output of today's Northwest available, if possible, for older machines in the field with a minimum of mechanical difficulty. A policy like this means money in your pocket — added value not only for you but for the man who buys from you. It's another good reason why you should plan to own a Northwest.

NORTHWEST ENGINEERING COMPANY
1506 Field Bldg., 135 South La Salle Street, Chicago 3, Illinois

it's another **NORTHWEST** in ROCK

Successful Contractors Stay Successful With Proved Equipment

Bucyrus-Erie Leadership in Walking Draglines...

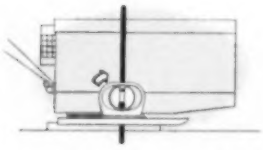
Exclusive ROLLING-CAM WALKING ACTION

One big reason why Bucyrus-Erie draglines are such smooth, steady workers is that they are smooth, steady *walkers*. They can step out in any direction . . . on loose sands, over swampy ground, along muddy river bottoms and the edges of banks . . . through weather that would stop crawler mounted machines.

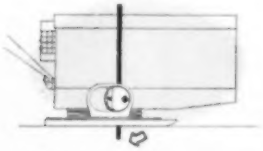
There's no jerking . . . no shocks to machinery, either, because the weight of the dragline is cushioned with almost unbelievable ease by Bucyrus-Erie's exclusive rolling-cam walking action.

100L52C

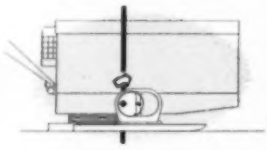
No other walking system is so smooth, so strong or so simple in design



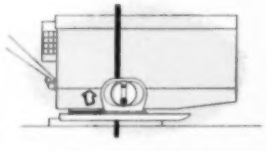
1. Working position. Shoes up — cams in center — guide roller pin at top.



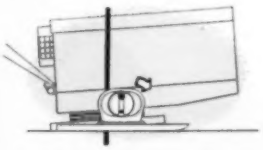
4. Base is lowered as cams continue to roll.



2. Cams rotate — advance shoes and place them on ground.



5. Rotation completed — return to original position.

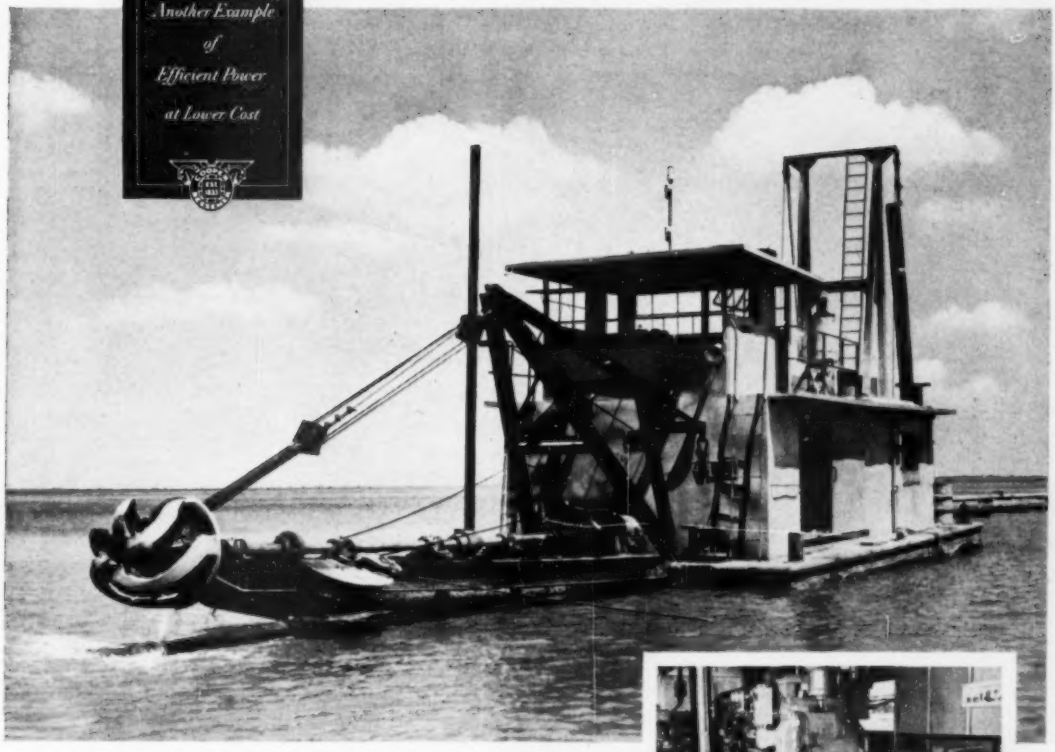


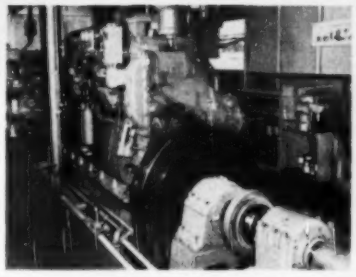
3. Leading edge of base lifts and skids along as cam rolls to half-way point in rotation.

BUCYRUS ERIE

South Milwaukee Wisconsin

Another Example of Efficient Power at Lower Cost





"General #1", owned and operated by General Dredging Co., Inc., St. Petersburg, is shown at work in Tampa Bay. Inset shows vessel's rugged, efficient 400 hp Cooper-Bessemer diesel.

Steel Digs In At Lower Cost

...WITH A COOPER-BESSEMER DIESEL

ADD up the diesel qualities that mean years of lowest cost operation . . . ruggedness, trouble-free design, full-range response, high efficiency, low maintenance. These are the advantages experienced by Cooper-Bessemer users in job after job. They pay off!

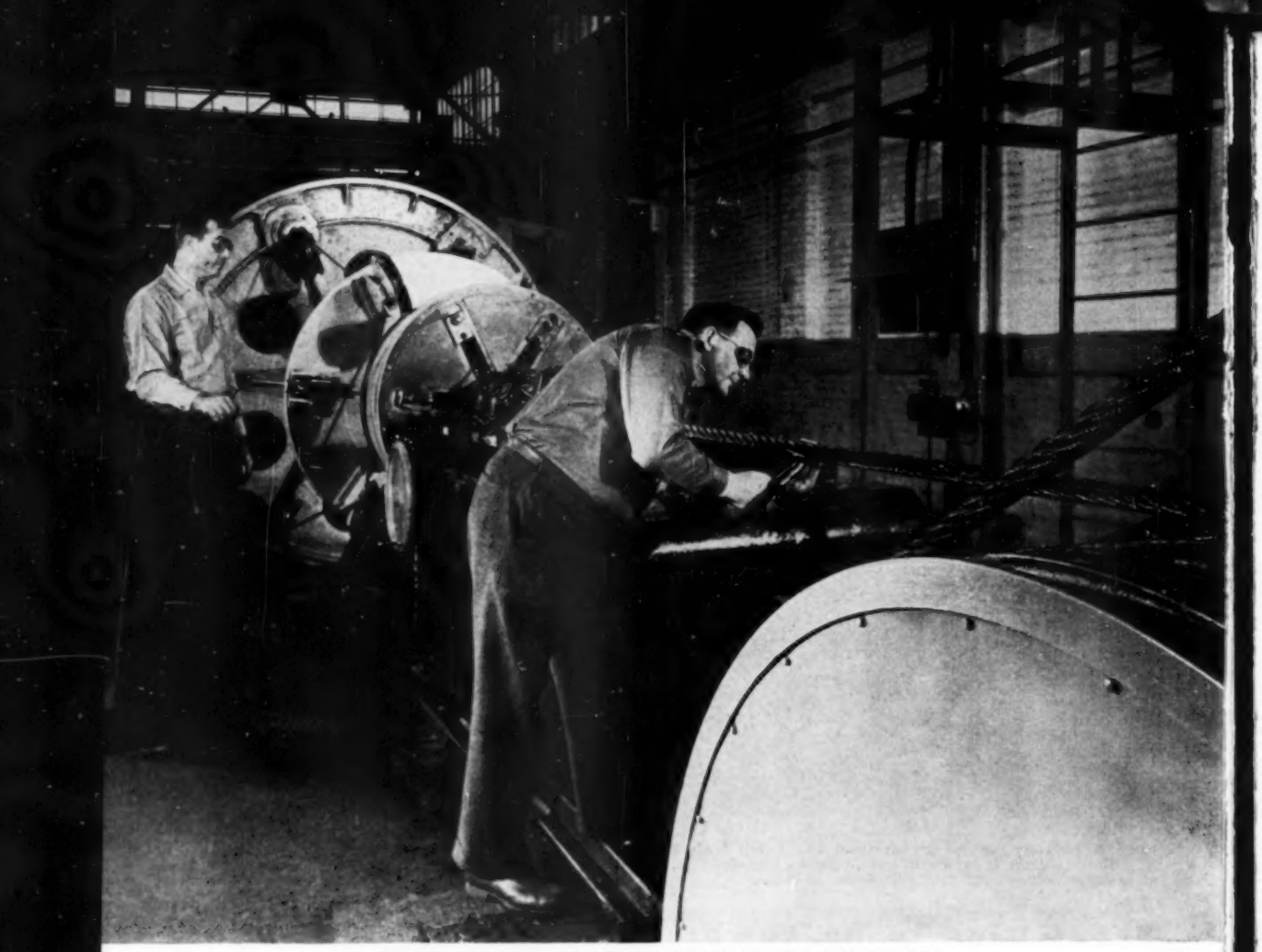
Shown here, for example, is General Dredging Company's new "General #1", Cooper-Bessemer powered for maximum work, minimum expense.

Located near you are experienced Cooper-Bessemer engineers ready to tell you all about the *plus* values modern Cooper-Bessemers offer in meeting your particular power needs.

The **Cooper-Bessemer** *Corporation*

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. New Orleans, La.



Here a big wire rope emerges from Bethlehem's 66-in. closing machine. At this stage of the checking, the inspector is making sure that the diameter is within specified tolerances.

He seldom has to say "No"

Saying "no" can be part of the Bethlehem rope inspector's job. Fortunately, he seldom has to use the veto power, for Bethlehem rope is made with such care that rejects are few. But the inspector won't hesitate to stop a rope if even a minor detail is subject to question.

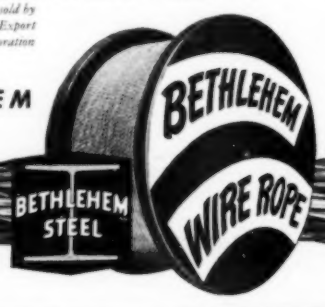
This is merely common sense. But it's also something more. It's the best possible protection for the buyer. It means that the dollars you spend for Bethlehem wire rope will buy what you pay for—a product that meets the highest standards of workmanship.

In the making of this product, nothing is left to chance. That's one of the reasons why Bethlehem rope is dependable rope . . . the kind that will serve you well in the toughest sort of going.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

When you think WIRE ROPE . . . think BETHLEHEM



Here's Double Quick [illegible]tibility

Hydrocrane to Hydrohoe in less than 4 hours

For high-speed front-end convertibility, the Bucyrus-Erie Hydrocrane heads the list. The J. P. Construction Company, Chicago Heights, Ill., reports converting from crane to dragshovel front-end *in less than four hours* — with only the operator and one other man.

Here's How This Owner Does The Job — First the crane boom is lowered onto two specially-designed tripods. Necessary fittings are disconnected and the truck driven away. Next, truck is backed up to the dragshovel front-end which is held parallel to the ground by means of another tripod and the Hydrohoe dipper resting on the ground. Fittings are connected and the Hydrohoe is ready to begin work. Converting back to crane front-end is equally simple.

The owner remarked that the crane's fast convertibility not only means time saved on his own jobs, but it permits crane rental without fear of lost time converting back to the attachment needed on his own work.

Get full details on the fast-working, fully hydraulic Hydrocrane and Hydrohoe. Send the coupon today.

HERE the Hydrocrane digs a manhole. Every operation fully hydraulic — boom hoist, line hoist, swing, boom telescope, outrigger set and retract and bucket close. Available with crane hook, mag. net, grapple, catch basin cleaning bucket and material handling bucket.

A quick field conversion — and here's your Hydrohoe. This smooth-digging outfit provides two separate digging actions: first, by means of a hydraulic ram located between boom and dipper handle; second, by telescoping the boom. This exclusive telescope feature eliminates moving truck back and forth when digging out boulders and excavating across pipe and cable — permits digging a level, scallop-free trench.

Bucyrus-Erie Hydrocrane Division
South Milwaukee, Wisconsin

South Milwaukee — BUCYRUS ERIE HYDROCRANE — Wisconsin

Gentlemen: Please send Hydrocrane literature ☐
Please send Hydrohoe literature ☐

Name .....
Company .....
Address .....
City ..... State .....

130H51C

an ACCO product

Reduce Dangers and Costs of Boom Cable Failures

● ACCO *Registered* DUALOC* Boom Cables are completely flexible with double-hinge action. They absorb vibration. No heat, acid, solder, tape, or tuck is used. No shear stresses are set up in rope so every DUALOC Boom Cable develops full catalog breaking strength of rope used. Open construction permits reliable inspection at all times.

Each completed DUALOC Boom Cable assembly is proof tested to two times its rated capacity before Registry Certificate is issued. DUALOC assemblies are the only replacements for wire rope sockets which do not lower safety factor originally built into your equipment. They are easy to install as their endings have same dimensions as zinced sockets. No alterations to equipment are necessary.

Write today for literature and quotation.

*Trade Mark Registered. Patent No. 2463199.

ACCO

WIRE ROPE SLING DEPARTMENT
AMERICAN CHAIN & CABLE

ACCO Registered DUALOC Slings

TRADE MARK

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

WHEN DIGGING'S TOUGH, THIS DIPPER'S TOUGHER

How service and manganese steel are cast and welded into **AMSCO** Dippers

More than 5,000,000 cubic yards of rock and abrasive materials have been dredged by one AMSCO All-Manganese Steel Dipper similar to this 1¾-yard model—and the end of its service is nowhere in sight!

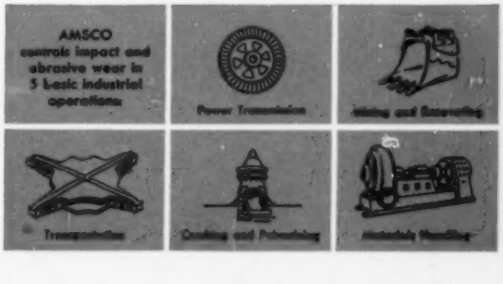
Service like this is expected—and considered normal—by users of AMSCO Dippers. Just as users throughout all industry know that AMSCO Manganese Steel Products mean service and long life wherever impact and abrasion must be controlled. AMSCO Manganese Steel has the unique quality of actually becoming harder with use, acquiring a high surface polish to shrug off grinding abrasion, while retaining body metal toughness.

Made *entirely* of "The Toughest Steel Known," AMSCO Manganese Steel Dippers use no rivets, but are fabricated by the modern, streamlining Plug-Welding method that permanently interlocks cast segments. AMSCO All-Manganese Steel Dippers are available in two-piece welded, three-piece renewable lip, and Missabi designs—or can be adapted to your unusual materials handling specifications. Also available in sizes to fit all power shovels.

Check these additional PLUS features:

- **One-piece Manganese Steel back casting.**
- **Top and bottom have cast-in, double-wall box-sections for maximum strength, minimum weight.**
- **Cast-in pin connecting lugs for handle, back, braces, bail.**
- **Bail is a one-piece casting with elongated tubular cross-section, for strength and lightness.**
- **Teeth are set for clean, fast digging.**
- **Interior is smooth and slightly tapered for free dumping.**

Contact your shovel manufacturer about AMSCO Dippers, or write AMSCO, Chicago Heights, Illinois.



AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

373 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill.; New Castle, Del.; Denver, Colo.; St. Louis, Mo.; Los Angeles, Calif.
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Quebec.

Excavating Engineer

founded 1905 · NOVEMBER, 1952

HIGHBALL DIRT AT LOOKOUT POINT

by Ray Day

Two-zone fill comes up rapidly as contractors shape new dam to muzzle the Willamette.

TWENTY-THREE miles up the Willamette river's middle fork from Eugene, Ore., a crew of dirt muckers is pouring 20,000 yards of fill across the river valley every 16 hours. These muckers are in a hurry. They have a $20 million contract with the Portland office of the Corps of Engineers, and working time is their most precious commodity. Because of their rush, Lookout Point Dam is rapidly taking shape.

Containing 7.8 million yards of earth fill, Lookout Point Dam is one of the important units in the control

of floods and development of hydroelectric power on the Willamette. If all goes well, and the dirt stiffs have got their fingers crossed hoping it will, the dam and reservoir will be operative in 1954. Remembering nearby Dorena Dam's construction, when Guy F. Atkinson Co. was limited one year to 78 working days on the earth fill, nobody can predict for sure what might happen between now and the completion date.

Six Companies Team Up

Six companies have teamed up on the joint venture for construction of the dam, spillway, outlet structure, and other allied structures. The contracting outfits include Morrison-Knudsen Co., Inc. of Boise; Peter Kiewit Sons' Co. of Omaha; Macco Corp. of Paramount, Calif.; Puget Sound Bridge & Dredging Co. of Seattle; and Bechtel Corp. and J. H. Pomeroy & Co. of San Francisco.

• Left: Picture catches part of overall construction setup with Bucyrus-Erie 200-W walking dragline at work in pit in far background. Unidentified shovel and dragline are shown in center of scene while in foreground Wooldridge scraper slips down pathway to main haul road along which it will waste its load. Above: Walking dragline is seen in background between boom and dipper of 54-B in main borrow pit for pervious material.

In importance as a key feature, Lookout Point's earth fill and excavation phase ranks close to the top. Aside from the fact that Lookout Point Dam is an earth fill structure, the dirt work ties in with many other closely timed items. For example, earth fill progress must be synchronized with stream diversion, concrete work, relocation of a railroad around the dam, and the relocation of existing highways in the area. As this is written, earth fill is slightly ahead of railroad relocation in the schedule of timing, in spite of a weather delay last winter.

Big Block of Earth Fill

The earth fill portion of Lookout Point represents a sizable chunk of dirt to contemplate along with a problematical working season. The dam is a whopping-big barrier 1,990 feet long and 24 feet wide at the crest, tapering outward to a maximum base width of 1,130 feet. At its maximum height the crest is 256 feet higher than the bedrock foundation upon which the structure rests. In designing the 7.8 million yard structure, engineers relied on three principal zones, consisting of but two types of material. A stiff, impervious clay zone in the center core acts as a water seal only. On both the upstream and downstream sides of this zone are virtually identical zones of well graded river gravel and sand, which will give the dam stability to ho'd a reservoir permanently, while power is generated and flood storage is conserved.

To handle the flow of the Willamette during construction of the dam, a progressive river diversion plan was developed. In the first stage, the river is permitted to flow in its normal channel while the south section of earth fill and the spillway structure are built. Earth dikes at this stage offer some protection in case of high water. In the next stage, the river is changed over to a slot left in the spillway structure. In the spring of 1953, this slot will be closed and the river turned through the regulating outlets. Finally, after the powerhouse is built, normal flow will be through the penstocks as the river is made to give up its hydroelectric potential on its way past the site. Final diversion

into the penstocks is expected to be ready by the spring of 1954.

Rough Bedrock Uncovered

Before construction of any part of the earthfill could be started, it was necessary to strip from 6 to 30 feet of typical stream overburden off the bedrock foundation, which project manager Lou Steelman describes as "the roughest and most uneven I've seen in 24 years with Morrison-Knudsen." Bedrock under the dam is a heavy volcanic structure, bedded in uneven planes.

To get the overburden off this tricky foundation, Steelman is using a combination of dragline-shovel-bulldozers, with drilling equipment and hauling units. A Manitowoc 3000 dragline with a 2½-yd. Esco bucket is used from the top, loading out some of the upper material to 15-yd. end-dump Euclids and 25-yd. belly-dump Eucs assigned to the project, and which will be detailed later on in this article. Working below the dragline, against the next bank between the dragline and bedrock, is a Bucyrus-Erie 54-B shovel, with a 2½-yd. Esco dipper. Its job is to load out the remaining material to similar Euclids, which haul the material to a stockpile near the downstream toe of the dam.

Since the foundation rock is so rough and uneven, it is impossible for the shovel to do a clean job and at the same time maintain its production or keep its footing level underneath the machine. The 54-B therefore dug only to the point where the first outcroppings of bedrock began to show up. Dozer work by a D8 Caterpillar then uncovered the rest of the bedrock and shoved the material ahead to the shovel or the dragline, where it could be loaded out. Considerable sporadic drilling with jackhammers and wagon drills is also necessary to place powder for separating the fragmented rock from sounder material underneath. In all cases the foundation is cleaned down to solid bedrock. Considering how rough this material is when it is finally uncovered, there should be no worry about how the dam is keyed into this material.

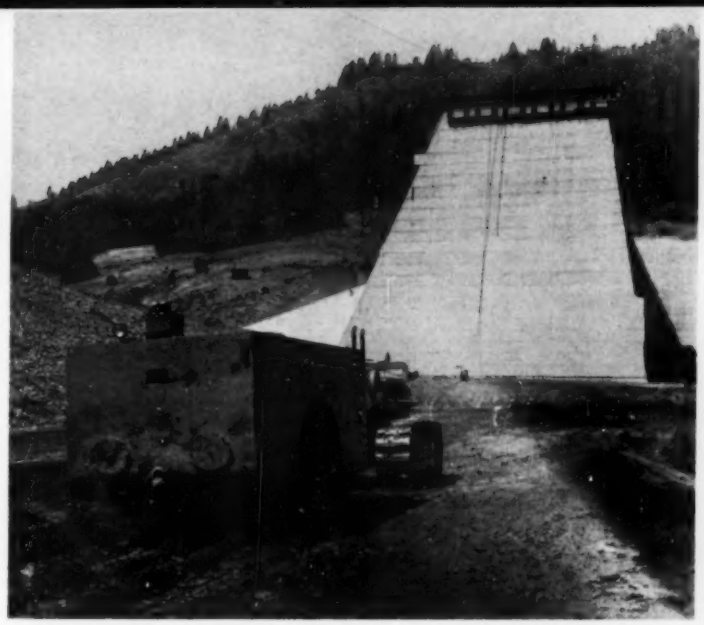
Fills Come From Borrow Pits

Fill material comes generally from selected borrow pits ahead of the dam in the reservoir area. Thus, when the dam is completed and the reservoir is filled, there will be no unsightly scars for visitors to see.

The contractors selected loading and hauling units which would operate at peak production over sustained months of service, if weather permitted. Principal units in the loading fleet include a Bucyrus-Erie 200-W walking dragline with 150 feet of boom and a 9½-yd. Esco bucket; a Marion 111-M with a 3½-yd. Hendrix bucket; a Northwest 95 dragline with a 3-yd. Esco bucket; and a Bucyrus-Erie 54-B shovel with a 2½-yd. Esco dipper. Also classed as loading equipment are four Wooldridge Terra Cobras.

The hauling fleet is a Euclid setup, with ten 15-yd. end-dump units, five 15-yd. belly dumps, and eleven of the big 25-yd. bottom-dump machines. There is no set pattern for assigning these hauling units to a dragline or shovel. The whole fleet is available and on call, and the dirt superintendent may have to make several changes in a shift to balance hauling units

• Bucyrus-Erie walking dragline reaches under river surface to pull up gravel and sand for Lookout Point Dam.



• Left Above: Belly-dump Euclid picks up fast load of pervious-zone material from dipper of Bucyrus-Erie 54-B shovel. Right above: Towed by International TD-24 crawler, Bros straight wheel roller compacts material in Lookout Point Dam impervious core.

against changing haul distances, pit conditions, or conditions on the dam.

Gravel and sand for the upstream and downstream pervious zones makes up a sizable percent of the yardage involved, so the bigger machines with highest outputs are assigned to the production of this material. In one big pit a Bucyrus-Erie 54-B shovel and the Bucyrus-Erie 200-W walking dragline are working as a team. After light stripping by the Terra Cobras, the 54-B is loading against a bank about 14 feet high, well in the clear of the 200-W. Haul road entrances to the shovel merge with the general haul road to the walking dragline, but there is no traffic pattern conflict while Euclids assigned to the two machines are in the pit.

Following the shovel, but working near the river where it can reach far down below water level, the 200-W works with its 9½-yd. bucket. Three swings of the bucket will make a 25-yd. Euclid bulge and spill over with material. Two swings will fill one of the 15-yd. machines.

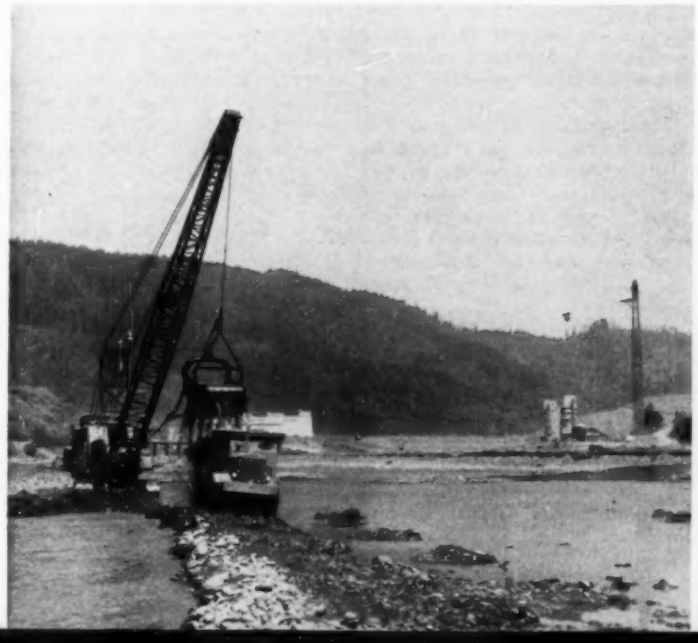
Use 50-ft. Highway

At another pit site, still another set-up for producing pervious-zone material is used. This consists of the Marion 111-M machine, loading into end-dump Euclids. As the hauling units leave the pit and start toward the dam, they use a broad, smooth, well maintained 50-ft. highway, which motor graders keep polished and free from loose rocks which are hard on tires. An interesting safety and maintenance rule posted in the form of a speed limit sign reads in engine rpm's . . . "Speed Limit: 2,100 rpm."

At the fill, the material dumped by the Euclids into the pervious zones is strung out as much as possible during the unloading process. A dozer then levels the lift, and a 70-ton Bros straight wheel rubber tire roller moves up for compaction. It is pulled by an International TD-24 tractor, which can move the massive compaction unit in 4th gear when the moisture content of the material is about average. It requires about four passes of the machine to develop the necessary compaction.

Excavation and placement of the clay ore zone is a completely different operation, largely because the clay is

• Downstream from dam in special temporary borrow area, Marion dragline loads pervious material to Euclid truck. Stationary mast of cableway can be seen in extreme right background.



• Caterpillar No. 12 motor grader dresses a haul road for Euclid being loaded by Northwest Model 6 dragline in background.

a peculiar material. During wet weather, haul roads become so slick that work in clay must stop. But there is no water penetration damage to the clay itself. The material lies in place close to its 17% optimum moisture content, and when it is compacted it is so impervious and hard that rains never penetrate more than about ½ inch. After the first 30 feet of this material was placed in the dam last fall, they allowed a rising river to flow right over the clay already in. When the river went down after flowing over the material all winter, a dozer scooped off about 1 inch of the top and operations resumed on a perfectly sound core.

The material is so hard after it is compacted that densities are taken by driving a sharp cylinder into the clay and by dropping a dozer blade on the metal. It often is necessary to make two drops of a dozer blade to get the penetration, and then they have to chop the cylinder out of the fill with a sharp axe.

Loading Equipment Set-Up

Loading equipment in the clay pit consists of a Northwest 95 dragline, with a 3-yd. Esco bucket. Euclids are used under this dragline according to the need of the moment, and much of the clay is also hauled by the four Wooldridge Terra Cobras. The material is spread on the fill in lifts not over 12 inches deep, leveled by a dozer, and rolled by a second Bros 70-ton straight wheel roller. A feature of interest is the fact that nothing but rubber-tire rolling is being used on any zone of Lookout Point. No sheepsfoot rollers are being used, and the pneumatic rolling is proving entirely satisfactory. Even the moisture content of the soil is being judged to a very great extent by the tire impressions from the roller. It is rare when the soil is too dry so that extensive amounts of moisture have to be added. Not so rare are wet conditions which cause the shovel to change its position in the borrow pit. Clay core material is not placed if it is too wet, even though the viscuous, tight material will have to stand no structural stresses in the dam.

Bad Winter Halts Work

Terrible weather last winter made work on this clay material impossible, but two months before hauling could resume on clay, it was possible to start the other two zones. As a result, these zones have now been built out ahead of the clay. Impervious zone operations are being speeded up to match progress on the other zones.

A good maintenance and upkeep program is keeping all the equipment available for the flash performance it must deliver consistently through the vital summer season. From 2 to 3 recaps and 900 to 1,500 hours of working life is being realized on rubber tires on the equipment, thanks to a regular checkup program and good maintenance of haul roads. There is little doubt in anybody's mind who has seen loads of material come to the dam that the tires are not being "babied."

Spare parts, spare engines for key equipment, and a good shop and service program round out the preventive maintenance item. Manufacturer's recommendations are used, and manufacturer's representatives are more than welcome on this project.

Concrete Work

Despite the earth fill construction of Lookout Point Dam, there are also some 850,000 yards of concrete in the spillway and powerhouse intake structures. Concrete work is well along in the spillway and was shut down when *Excavating Engineer* visited the project, waiting for the relocation of the railroad which now runs through the center of the dam. Concrete materials are hauled in to a central batching plant, mixed there, and sent out to the placement point by cableway. The cableway spans the river valley from abutment to abutment, and consists of a traveling tail tower on the spillway side which is hooked to a stationary head tower on the left abutment. The batch plant is so located that most of the concrete must be raised in elevation going to its point of placement.

A Dam With a Purpose

When Lookout Point Dam is finished in 1954, it is expected to fulfill as definite a purpose as any dam ever built on America's streams. The dam and reservoir is the principal unit of quite an ambitious scheme ultimately planned for the middle fork basin. The ultimate plan includes 3 power generating plants totaling 115,000 kilowatts at Lookout Point; an auxiliary flood control reservoir on Fall Creek nearby; a storage reservoir and power plant on the middle fork at Hills Creek; a drawdown tunnel for utilization of natural storage at Waldo lake during critical power years; and a re-regulating dam with power facilities at Dexter site about 3 miles below Lookout Point. The Flood Control Act of 1950 authorized these projects.

Lookout Point has been planned and will be operated as a multiple purpose

• They are part of the Lookout Dam key crew. Standing, from left to right, are Office Manager Don Drugan and Caroline Fryberg, secretary to Project Manager Lou Steelman who is seated with Warehouse Manager J. E. Crooks.

reservoir. During the late fall and winter the reservoir will be held at minimum flood control elevation to provide space for storage of excess water during the critical runoff periods. Early in the spring when the danger of severe floods has passed, the reservoir will be filled at a uniform rate so that it will normally be full by early May. During the conservation season from May until early fall, the pool will be maintained at the highest possible level after downstream demands have been satisfied. Water released during the conservation season will be used for power generation. During the fall and early winter, the stored water not needed for conservation purposes and the normal river flow will be let out for additional power.

As compensation for the loss of upstream salmon spawning areas resulting from the dam's construction, the Corps of Engineers is financing the increased cost of operation of the existing hatchery, and the construction and operation of a new salmon hatchery at Oakridge, Ore. Also, a permanent salmon holding and egg collecting station will be built approximately seven miles below the dam. These facilities will be operated by the Oregon Fish Commission.

Specifications of Dam

Lookout Point Dam will serve a drainage area estimated at 991 square miles. While the length of the earth dam section is 1,990 feet at its crest, the overall length of the dam, including the spillway section, will be 3,370 feet. The reservoir will back upriver 14.2 miles, creating a normal pool area of 4,360 acres. Total storage is 456,000 acre feet. Of this amount, 88,000 acre feet is inactive; 28,000 acre feet is set aside for power development; 110,000 acre feet is allocated to joint use for flood control and power generation; and 230,000 acre feet is earmarked for flood control storage only.

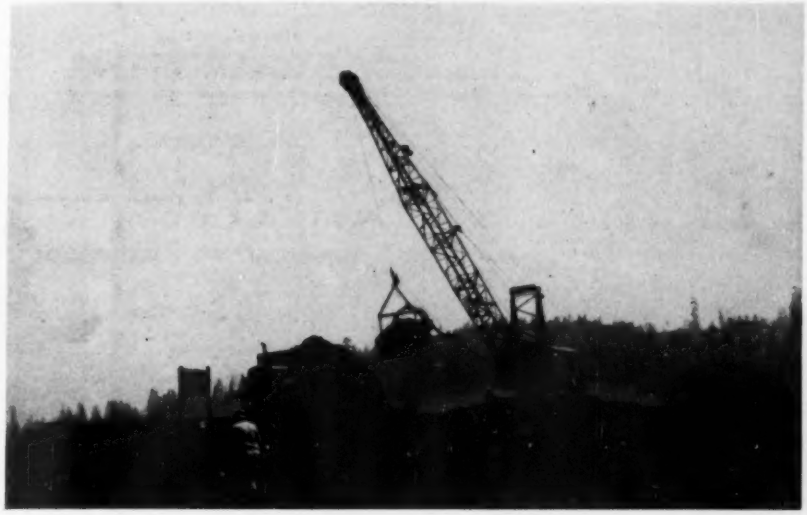
The spillway is a reinforced concrete controlled overflow structure 278 feet high. It is designed to discharge 270,000 cubic feet of water per second in periods of extreme input.

Railroad relocation work was started in May, 1947, and construction of the dam was started in July, 1949. Included in the construction items are the relocation of 23 miles of main line railroad, 13 miles of state highway, and 16 miles of county secondary roads.

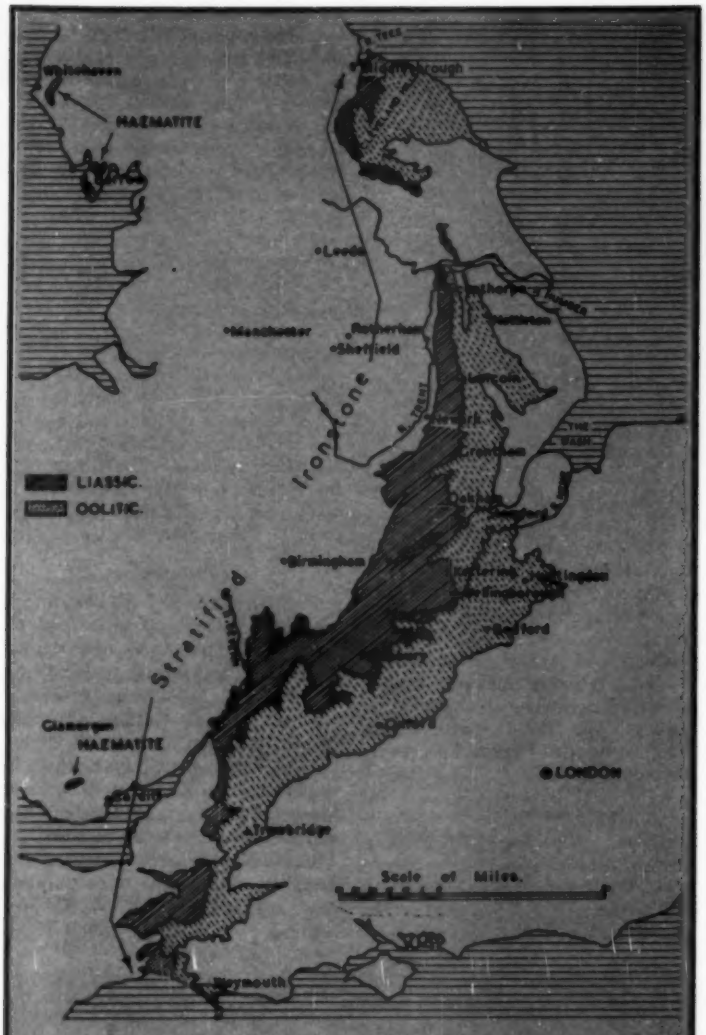
Personnel

Field operations for the contractors are under the general supervision of L. E. "Lou" Steelman, with Harold Maxwell as his assistant project manager. D. W. Lutes is project engineer. John Logan is excavation and fill superintendent; Don Adkins is concrete superintendent; John Erickson is carpenter superintendent; Gordon Marquiss is hauling superintendent; and Don Drugan is office manager.

Corps of Engineers operations are under supervision of C. C. Davis, resident engineer, assisted by Thomas Waring.



• Northwest dragline operating in clay pit loads Euclids traveling to dam's center zone. The material is spread on the fill in lifts not over 12 inches deep.



• The Iron Crescent of England runs through the center of the country. Iron ore areas are indicated by dark shading according to geological formation.

England's Iron Crescent

by Edmund Updale

Running through the center of England is a crescent shaped iron ore system which is considered the most important in the United Kingdom. The Iron Crescent is about 150 miles long and up to 60 miles wide. The 14 million ton yield is needed more than ever today in export-short Britain.

IT was his lucky day, many thousands of years ago, when a fur-clad ancient Briton stubbed a toe on a chunk of heavy stone. The boulder was tough and the primitive man fashioned a crude implement with it, to help him dig for more.

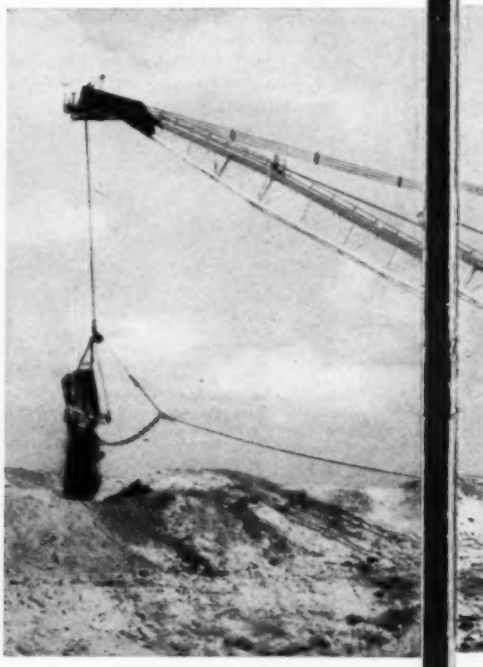
He had stumbled upon an outcrop of the great Jurassic iron ore system, the most important in the United Kingdom. To him it meant better weapons to help him kill game.

To Britain today it means food, too. It is from this ore that much of the machinery for export and for manufacturing other exports is made.

The Iron Crescent, nearly 150 miles long and up to 60 miles wide, is yielding about 14 million tons of iron ore a year, and more than 70 million tons of overburden are being shifted annually to reach it. The entire working area is now covered by a system of mechanization which began before the end of the last century with the introduction of the first British Wilson machine. It was followed by American Atlantics and other British and imported excavators.

The power which has unlocked the iron ore treasure chest has increased along the years, but even today it is not always enough for the big job.

With iron ore hiding ever deeper the Bucyrus-Eries, Ruston-Bucyrus, Ran-



some and Rapier, Lima, and Marion excavators and their allied equipment reveal it as orders go out for longer booms and bigger draglines.

New to the scene with its 175-ft. high jibhead is the British-made Ransome and Rapier W 1400 walking dragline. It is moving clay and limestone overburden in 27-ton bites.

Old and New Equipment

Those who climb the catwalk of the Rapier as it works in the heart of England are rewarded by a spectacle of new and old excavating equipment in Britain's busiest open-pit ore field.

They see, two miles distant, the massive outline of a modern Bucyrus-Erie 1150-B walking dragline, shifting up to 20,000 tons of overburden a day with its 19-yd. dipper.

They see, away to the east, the tips of steam shovels which have been toiling in these red fields for half a century.

And as they look down the mile-long pit over which the Rapier W 1400 stands, toward the Ruston-Bucyrus 100-RB loading ore into railway wagons with its 3½-yd. dipper, they may well feel that they have lived, in a few moments, through 50 years of excavating history.

Size is not everything. The whole scene must be viewed, and the smallest jackhammer is no less vital than the scores of excavators whose work it has made easier.

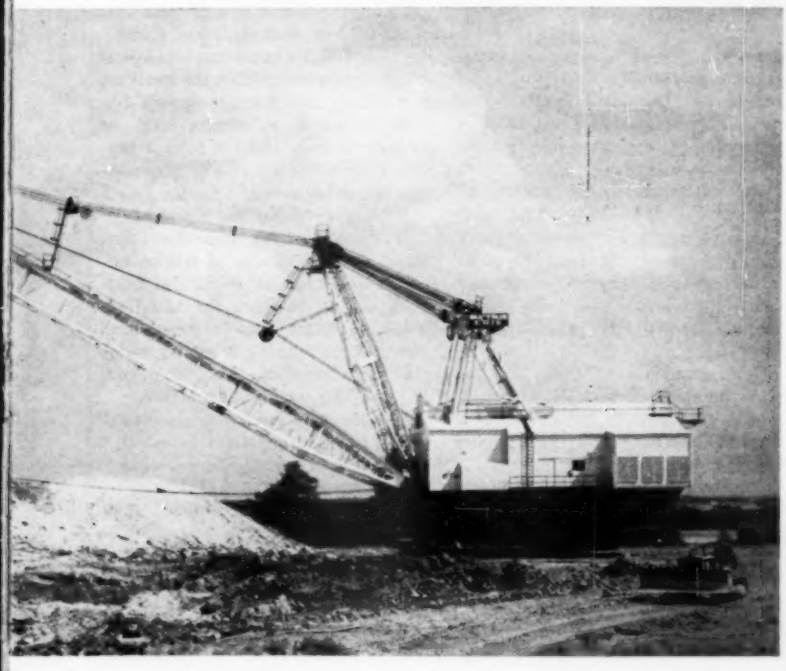
● Two electrically operated machines are at work in this pit. Close to the camera Ruston-Bucyrus 100-RB picks up ore with 3½-yd. dipper. Downpit, Rapier 9-yd. shovel strips and dumps back.

This report from the field describes some of the operations of Stewarts and Lloyds Minerals, Ltd., most important iron ore miners in this country. They have invested millions of pounds sterling in all sorts of heavy and light equipment.

With it they produce one third of all the iron ore dug in the British Isles. While a percentage of the iron ore is sold to customers, most of it is taken right through to finished products by the parent company.

The great ore field extends around the main center at Corby, Northamptonshire, the town that was a struggling village little more than 20 years ago. Today there is no more prosperous town in the whole of Britain, and the 17,000 people compared with 1,500 in 1930, enjoy full employment, thanks to the iron ore mines and the ore smelting, steelmaking, and steel manufacturing processes they feed.

Since Stewarts and Lloyds came to



● Left: This Bucyrus-Erie 1150-B walking dragline adds to mound of few hours' stripping with its 19-yd. bucket as Caterpillar D8 cleans pit in foreground. Below: Ruston-Bucyrus 55-RB performs double operation as it strips overburden and loads exposed ore to rail cars.

• Maintenance of the fleet of shovels, draglines, and auxiliary equipment is a big item. Stewarts and Lloyds machine shop offers proof of this fact.

• Two Caterpillar D8's with scrapers do clean-up work at Lowick mine.

• Though built in 1900, this Wilson steam shovel is expected to work for several more years. The machine carries a 72-ft. boom.

Corby their workers have mined 40 million tons of iron ore, and the men who do the work are among the toughest to be found anywhere – men with iron in their blood.

Senior engineers have been sent to the United States at the firm's expense to study American excavating methods, and others have traveled to distant parts of the British Commonwealth to spread the knowledge possessed by a vast organization which has dug its way up from wheel barrows to walking Goliaths.

The mechanical armada faces many difficulties. Overburden is becoming truly formidable with nearly all the feather-bed deposits worked out. The iron content of the ore varies sharply from pit to pit presenting the double problem of keeping every excavator in paying use while assuring a flow of balanced, self-fluxing ore to the furnaces.

There is also the constant problem of rising costs, in the field and right through the industry. More and more ingenuity is being displayed in every schedule as planners hold production costs down. The trend is always towards bigger machines, capable of postponing the day when deep mining methods must be used.

The first dragline was introduced as long ago as 1916, when blockaded Britain in World War I needed every scrap of home-produced ore she could scrape up to make guns, tanks, and shells. The machine that made history was a Class 14 Bucyrus-Erie steam dragline.

Other draglines followed, ranging from the small convertible Ruston 4, with ½-yd. capacity, to the Ruston-Bucyrus 21-RB, 24-RB, 52-RB, and 55-RB models.

Shortly after the outbreak of World War II the first walking dragline appeared in Britain. It was a Bucyrus-Monighan 5W, brought from the United States to the Northamptonshire workings. Another 5W was introduced soon afterwards.

As the build-up continued other walking draglines joined the force—the Ransome and Rapier W 80 and W 90, the Bucyrus-Erie 1150-B.

And now—the big Rapier is slewing on its 260-ft. dumping radius with a pass every 70 seconds.

Around this imposing array of strippers, the company's geologists and engineers conspire to mine the last worthwhile speck of iron ore with an equally impressive battalion of loading shovels—steam, diesel, and electric.

Consider New Sites

Thorough examination of new sites is carried out with drill and theodolite before decisions are put into effect. Minimum depth at which the stratified iron ore of the Jurassic system has been worked is at surface level, or covered by only about a foot of topsoil. These areas are rapidly diminishing, and only one—at Glendon North —is being worked in the region.

It is almost a basic requirement that future quarries should be able to justify at least 12 years' working at maximum output, to cover the initial expense of getting down to the ore-bed. The cost of opening a quarry today may be more than 500,000 pounds ($1,400,000), and will be higher.

The 12-year "guarantee" is considerably less than the term for which a mine might reasonably be expected to keep producing.

Although the iron content, which may be as low as 18% or as high as 40%, is considerably less than that of many foreign ores, it is produced at relatively low cost because of its accessibility.

The economical delivery of the self-

• New Rapier W1400 walking dragline dumps load as it stands on limestone bed. The 1,600-ton machine has tubular boom construction.

fluxing burden to blast furnaces, which are built in the heart of the orefield, is a vital link in the chain of successful management of the mines.

The ore bed is thoroughly sampled in advance of loading, and from the analysis received, loading quantities are regulated and controlled.

Railroad cars carrying various grades of ore from different mines are shipped according to this plan, the resultant delivery to the ore preparation plant corresponding to a self-fluxing mixture.

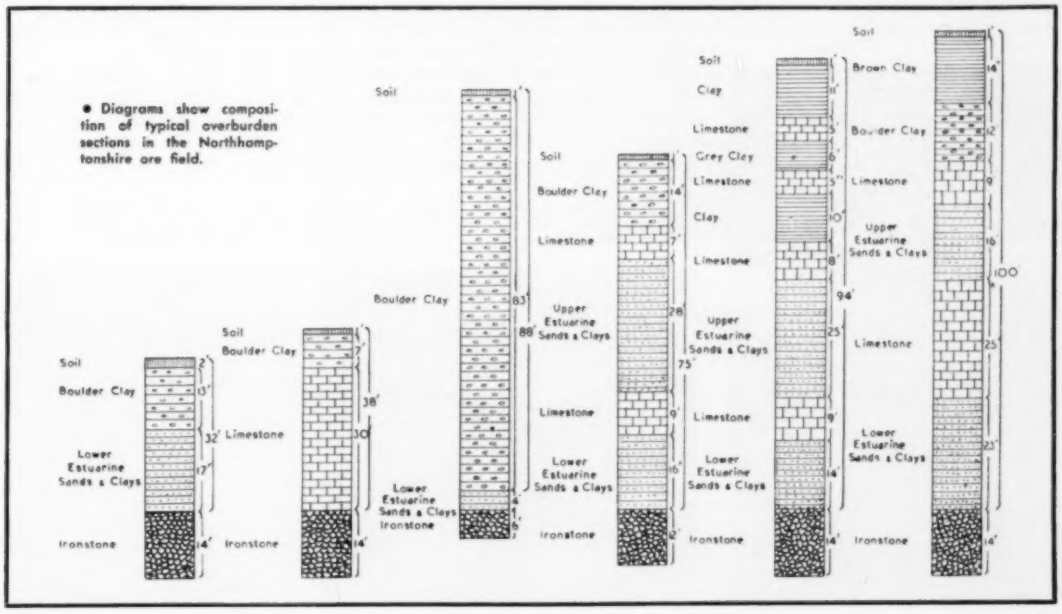
The arterial railroad system covering the orefield and linking mines is a prime consideration when a new mine is planned, access and exit by rail being a dominant factor. Another major point, the dip of the ore strata, gives an indication of the drainage system required and the likelihood of a pumping plant being necessary.

Facts relating to faults in the ore, washouts, presence of limestone in the overburden, depth of overburden and abnormalities in the iron content of the ore are determined by exploration.

If limestone is present the path of the initial cut of a new mine is blasted by vertical drilling. In recent years it has been the usual practice to employ a dragline for opening up, because of its larger dumping radius.

When the line of the cut has been decided and the direction of working ascertained, the dragline proceeds to pull out the overburden

A standard gauge—4 feet 8½ inches



wide—railroad is then laid on the ore bed, and all is ready for the loading shovel to swing into action.

When the dragline has opened out the whole length of the pit, and sufficient ore has been extracted, the second cut is commenced.

The dragline disposes of the new overburden, dumping it in the worked-out portion of the cut.

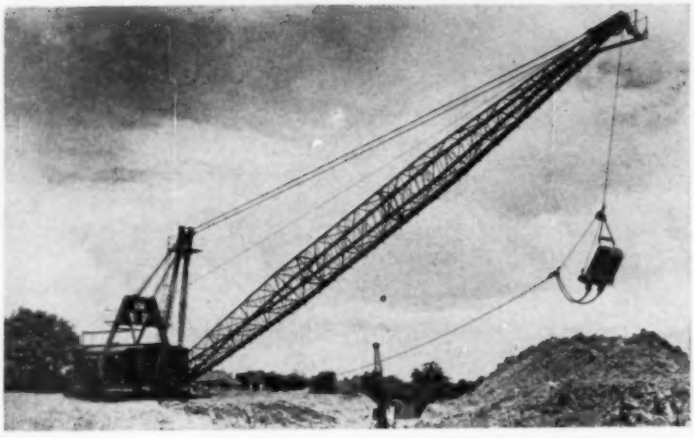
About 550 steel railroad wagons are constantly in use in the orefield, and they are of varying makes and sizes from 20 to 30 tons. Typical locomotives in use are the Robert Stephenson and Hawthorne (18x26), Kitson (16x22) and Hudswell Clark (15x22).

Wagons are not detailed for any specific mine, the method being to supply rail transport in sufficient strength at any given time to cope with requirements.

Continuous Strata

The ore strata is practically continuous, and as faults and washouts have been carefully explored by drilling and slurry sample beforehand, non-productive stripping is reduced to a minimum. Once the decision has been made and a new mine is opened the removal of overburden is pressed forward without delay, to keep well ahead of loading out.

No attempt is made to probe for ore which provides optimum burden. "Take it as it comes" is the rule. When a great deal of non-paying stripping must be done to maintain continuity of progress the dragline or draglines may be supplemented by scraper teams to speed the return to the orebed.



• Mixed overburden — clays and prepared limestone going to depth of 30 feet is removed by Ruston-Bucyrus 5-W electric walking dragline with 5-yd. bucket.

Northampton sand iron ore, the the mining of which is the special concern of Stewarts and Lloyds, is usually covered by estuarine clays and sands to a depth varying between 0 and 35 feet, but is often overlaid by the formidable limestone, which reaches about 130 feet in thickness, although the thickness in open pit areas rarely exceeds 35 feet.

The limestone varies in toughness, and may sometimes be removed without blasting, but preparation for the shovels and draglines is usually necessary.

A standard method has been developed and adopted for blasting, and by it the limestone is fragmented into convenient sizes without impeding work on the section of orebed being worked out.

Much of the limestone is drilled for blasting by percussion and rotary type vertical drills, such as the Emsco or Ruston-Bucyrus 42-RT machines.

Lately horizontal drilling has been adopted in many mines where heavy limestone is encountered.

Auger drills put 6-in. holes in the soft sands and clays at the base of the limestone formation, the drill being mounted on a Ruston-Bucyrus shovel chassis for mobility and convenience.

Use Buffer Blasting

The highwall is protected and maintained virtually intact by buffer blasting, the holes being taken in to about 80 feet while the width of cut by dragline or shovel stripping the overburden is only about 50 feet.

The entire explosive charge is placed in the back 50 feet of the holes, the rest of the space behind the opencast gelignite being stemmed with sand.

The buffer thus formed is vital, as

• At Stanion Lane South mine, Euclid dumps into rail car from concrete ramp with rear wheel checkwall.

• Steam-actuated conveyor moves spoil for Ruston 20 shovel as scraper levels spoil bank behind conveyor boom.

its absence or reduction, with a slight excess over the optimum charge of one pound of explosive to every five yards of material to be shattered, causes the highwall to loosen or collapse.

First-class fragmentation is obtained by the buffer method, the highwall continuing to provide a firm, level bed, adequately capable of supporting even the heaviest walking draglines as they proceed on their way, two yards from the highwall lip.

Initial break-up of limestone in the first gullet of a new mine, when the horizontal method cannot, of course, be applied, has been achieved by the use of Ruston-Bucyrus 42-RT drills, sinking 9-in. holes at 10 to 18-ft. centers.

Blasting of limestone is an almost daily feature of operations at Prior's Hall mines, where the biggest dragline, assembled on the site, has been sentenced to 35 years' hard labor.

The Rapier W 1400 is stripping 100 feet of overburden, consisting of 60 feet of clays, 20 feet of limestone, and 20 feet of sands and clays to get at the ore bed.

The loading shovel is a Ruston-Bucyrus 100-RB electric machine with 3½-yd. dipper, and it was working half a mile away on a vein of ore 6 feet thick when the site was visited.

A Caterpillar D8 dozer was cleaning up ahead of the stripper's shoes in readiness for the next advance. This tractor will stay permanently in attendance.

The dragline's 1,650 tons are now solidly established on a firm limestone walk. The 20-ft. slab of limestone is broken up for the dragline by the McCarthy horizontal drill, mounted on a Ruston-Bucyrus chassis, as shown in the illustration.

Blasting is by the buffer system mentioned earlier, and in one recent operation 13,000 lbs. of opencast gelignite were detonated in a single firing.

A Ruston-Bucyrus 22-RW drill was prospecting in advance of the cut being cleared, taking slurry samples for future guidance.

Prior's Hall mine will eventually have advanced more than 1,200 yards in successive cuts about 50 feet wide, and will probably yield 8 million tons of ore in all.

The method of working the mine is identical with the general system described earlier, the important difference being that of depth.

Two shifts are operated — from 6 AM to 2 PM, and from then to 10 PM, when the floodlights on the Rapier are switched off, leaving a light on the boom point as a warning to passing aircraft on their way to and from London Airport.

This pit, like most of those in the Northampton sand iron ore fields, is all-electric, power being stepped down from the mains supply of 33KV. The 6.6KV supply for the big dragline comes from a transformer station and switchhouse by trailing cables.

In accordance with Stewarts and Lloyds' policy of interchangeable equipment, main drive motors, M.G. sets, hoist and drag units conform to requirements in this respect.

Several mines operate Diesel mining and loading machines, but only one is all-Diesel, including haulage. This is at Stanion Lane South, where trucking is employed for movement of ore.

The stripper is a Lima 1202 dragline, swinging a 3-yd. bucket, and the ore bed, approximately 8 feet thick and of about 30% quality, is being cleared by a Ruston-Bucyrus 54-RB dragline with 2½-yd. bucket.

This dragline dumps ore into 13-ton rear-dump Euclid trucks, which take their loads around to a brick and concrete tipping ramp overlooking the quarry.

The Euclids back up the ramp, the rear wheels being checked by a 15-in. wall, over which the trucks discharge the ore into rail wagons waiting below.

In this quarry a Stephenson and Hawthorne locomotive is hauling trains of 30-ton steel wagons, 12 to 15 at a time, built to the design of Stewarts and Lloyds by Charles Roberts & Co.

The fully-loaded Euclids were tipping into the wagons below at the rate of one a minute when the quarry was visited by *Excavating Engineer*, and they returned by the same route to be reloaded in the pit by the 54-RB dragline.

The Lima is dealing with overburden which is at present only about 12 feet deep, consisting of glacial drift — boulder clay. It is working about four days' output ahead of the loader.

The Lima and Ruston-Bucyrus machines have between them dug more than 1 million tons of iron ore at Stanion Lane South mine, and another 350,000 tons are looked for before this moderate size working is cleaned out, early in 1953.

Within sound of these machines is a

• Right: Old steam operated 3½-yd. shovel worked to limit of its reach is being replaced by larger 9-yd. Rapier (right). Below: Early operations at new mine find Ruston-Bucyrus 21-RB dragline with ¾-yd. bucket stripping shallow overburden.

M-R-S handles the Big Ones!

SHORT TURNING CIRCLE and high maneuverability makes M-R-S ideal for construction of narrow secondary roads.

OUTSTANDING VERSATILITY is displayed by M-R-S 190 as it pulls a giant ripper.

Prime mover for up to 20 yard struck scrapers with exclusive WEIGHT TRANSFER!

You can change your large four wheel scraper operations from a possible loss to extra profits with M-R-S rubber tired power. M-R-S offers you the valuable switch to high speed rubber without losing your big investment in large four wheel scrapers. Scrapers which are in A-1 mechanical condition but are decreasing in value because of the rapid trend to rubber.

With M-R-S you get all the big advantages of rubber without the SINGLE PURPOSE CHARACTERISTICS of specialized units.

The high traction and drawbar pull which result from the exclusive WEIGHT TRANSFER enables M-R-S 190 tractors to serve as prime movers for up to 20 yard struck capacity scrapers.

The following is typical of the production results possible to be obtained by switching to the largest M-R-S rubber tired prime mover:

HAUL: 1675 ft. one-way	M-R-S 190 & 19.2 struck scraper	Larger crawler & 19.2 struck scraper
Total production per hour—cu. yd.	237.5	146.2
Revenue per hour at 14c per cu. yd. (estimated contract price for scraper operations only)	$ 33.25	$ 20.47
Estimated ownership & operating cost per hr.	$ 12.04	$ 11.84
Estimated gross profit per hour	$ 21.21	$ 8.63
Ratio of M-R-S production	162.4%	100%
Estimated Ratio of M-R-S profit	246.77%	100%

*Production taken from an actual on the job test, and calculations made to estimate the possible increased profit ratio resulting from the increased production actually secured.

Don't you think it will pay you to *INVESTIGATE* before you *INVEST*?

COMPANY

FLORA AND JACKSON, MISSISSIPPI, U. S. A.

mine which is the most unusual in the entire ore field, and many visitors consider it to be the most interesting.

It is the only steam operation in the ore field. The two shovels in use for stripping and rockloading are a British-made Wilson, a prototype of modern large radius machines, and an equally tried and trusty Ruston 20.

Work 50-Year-Old Shovel

The Wilson, built around 1900 and working ever since, is now in its sixth mine, and is stripping about 30 feet of overburden with its 2-yd. bucket.

The Ruston 20, vintage 1918, loads the ore with a 2½-yd. dipper, and like the stripper it is giving paying service.

Coal for both shovels is brought to the site by rail.

The Wilson stripper, despite its extreme age, embodies many features which might well be of recent design. The machine was specially designed for Lloyds Ironstone Co. — now incorporated in Stewards and Lloyds — and at the time of its appearance it was of such interest that American excavating engineers crossed the Atlantic to see it working.

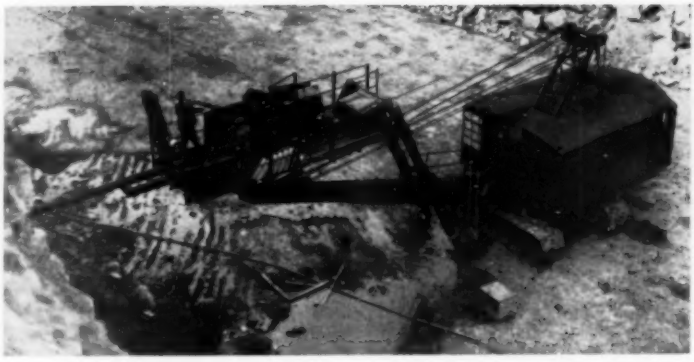
In the original model the winding, slewing and travelling were all operated from the same engine by means of clutches, and the racking was achieved by means of a steam ram.

When overburden became deeper, it was necessary to increase the dumping radius. The machine was remade by Lloyds' chief engineer in 1904-5. He increased the base to give extra stability, lengthened the bucket arms and increased the capacity of the bucket from 1½ to 2¼ yards.

Separate engines for slewing and racking were installed, and wire rope transmission was introduced for these operations, the changes vastly increasing output. The jib A-frame, base and main engines are substantially the same as those in the original Wilson.

There are a number of mines in the region which are duplicates of each other as regards equipment. In these pits, which are all electric, power is supplied at 3.3KV from the 11KV transformer station, being stepped down near the pit.

Stripping is by Ransome and Rapier 5360-type shovels with 9-yd. buckets, the machines working as a general rule on overburden up to 55 feet in depth. Sometimes this depth is exceeded, usually to overcome temporary conditions, such as the negotiation of a fault in the ore bed.



• McCarthy horizontal drill rig bores into limestone highwall for buffer method blasting. Rig is mounted on Ruston-Bucyrus shovel for faster positioning.

The loading shovel, working on an ore bed which may be from 6 to 10 feet thick, is a Ruston-Bucyrus 100-RB 3½-yd. dipper, and it loads directly into rail wagons.

The 100-RB is served by an Ingersoll Rand J 50 air drill when the ore requires preparation by blasting. The rig sinks 2-in. holes down to within 2 feet or so of the base of the ore bed, depending upon the toughness of the bottom layers.

Two pounds of dynamite are packed into each hole, the remainder being stemmed with limestone grit from the workings. Nobel 704 cartridges are fired by electrical delayed action detonation.

One mine with the standard excavating set-up is Earlstrees, where the 9-yd. shovel is stripping 40 feet of overburden to clear an 8-ft. ore bed for the 100-RB. Since the first cut was opened, three years ago, the wagons have taken away 450,000 tons of good quality ore.

Scrapers Remove Topsoil

As with many of the mines, the top 12 inches of overburden was stripped by scraper teams — Caterpillar D8's with 13.5-yd. scrapers — and the topsoil is preserved in special dumps for eventual replacement, after the spoilbanks have been leveled by dozers and draglines.

Ruston-Bucyrus 22-RW drills were sinking 6-in. holes 40 feet deep at intervals of 200 to 800 feet on the advance side of Earlstrees mine, exploring ahead in the usual way. These drills are always in use, probing the field.

This operation is of vital importance for Stewarts and Lloyds, who must be able to see years ahead as regards probable output of ore.

Each borehole is tubed and a slurry sample taken to determine the quality and thickness of the ore bed. No cores are extracted, as the slurry samples have proved entirely satisfactory and less difficult to obtain.

One series of advance drillings accurately predicted a major fault in the iron ore deposit, in Rockingham mine, and the fault had been encountered exactly where expected at the time the working was visited.

At this quarry the 9-yd. shovel was getting near the absolute limit of its reach, working up from a depth of about 65 feet. It is likely that the fault will be negotiated without the assistance of more machinery than is normally used in the mine, however.

Limestone 20 feet thick has to be drilled for blasting by the Bucyrus-Erie and Ruston-Bucyrus 42-RT cable drills in yet another quarry — Brookfields Cottage. Here the stripper is a Bucyrus-Erie 1150-B electric walking dragline with 19-yd. bucket. The Bucyrus-Erie 1150-B was eating into the rock and clay overburden at the rate of 20,000 tons a 16-hour working day.

Railway Crosses Mine

At one point in the ore field the main line of British Railways from London to the north runs through a tunnel 1¼ miles long, and the tunnel is crossed approximately at right angles by one of the iron ore mines. This mine, now being worked for a length of about ½ mile, is 48 feet deep.

Overburden is being stripped by a Rapier 5360 using a 9-yd. bucket and loading into rail wagons in the normal way. The ore is dug by a Ruston-Bucyrus 100-RB with 3½-yd. dipper.

British and American tractors were busy at Cowthick mine, helping to car-

• After 80-ft. borehole has been completed, 50-lb. opencast gelignite charge is loaded.

• A 3-ton firing takes place in limestone section.

• After section of limestone is blasted, the wall is shattered but remains stable.

• Mixed surface overburden — clays, sand — breaks up following blasting of limestone below.

ry through an interesting operation during the negotiation of fault in the ore bed.

A Caterpillar D8 with 13.5-yd. scraper was working in conjunction with the new British Vickers VR 180 tractor and 12-yd. scraper, their task being to drive a shallow cut along the line of the fault, which intersects the face at an angle of approximately 30°.

The new cut was necessary because the stripper could not dispose of the additional spoil presented by a sudden increase in the depth of overburden, owing to the drop in the ore bed.

In Park Lodge mine a Ruston-Bucyrus 5W Ward Leonard electric walking dragline is stripping about 40 feet of clay and limestone with its 5-yd. bucket. When the ore bed has been reached in this mine, a Ruston-Bucyrus 100-RB electric shovel with 3½-yd. dipper will roll in to mop up the ore.

This working is expected to last for 30 years, and will probably yield 10 millions tons of ore during that time.

Independent ore-producing companies operate mines in the same area as that worked by Stewarts and Lloyds on the most cordial terms, and the companies confer through the Northamptonshire Mine Owners' Association and the National Council of Associated Iron Ore Producers.

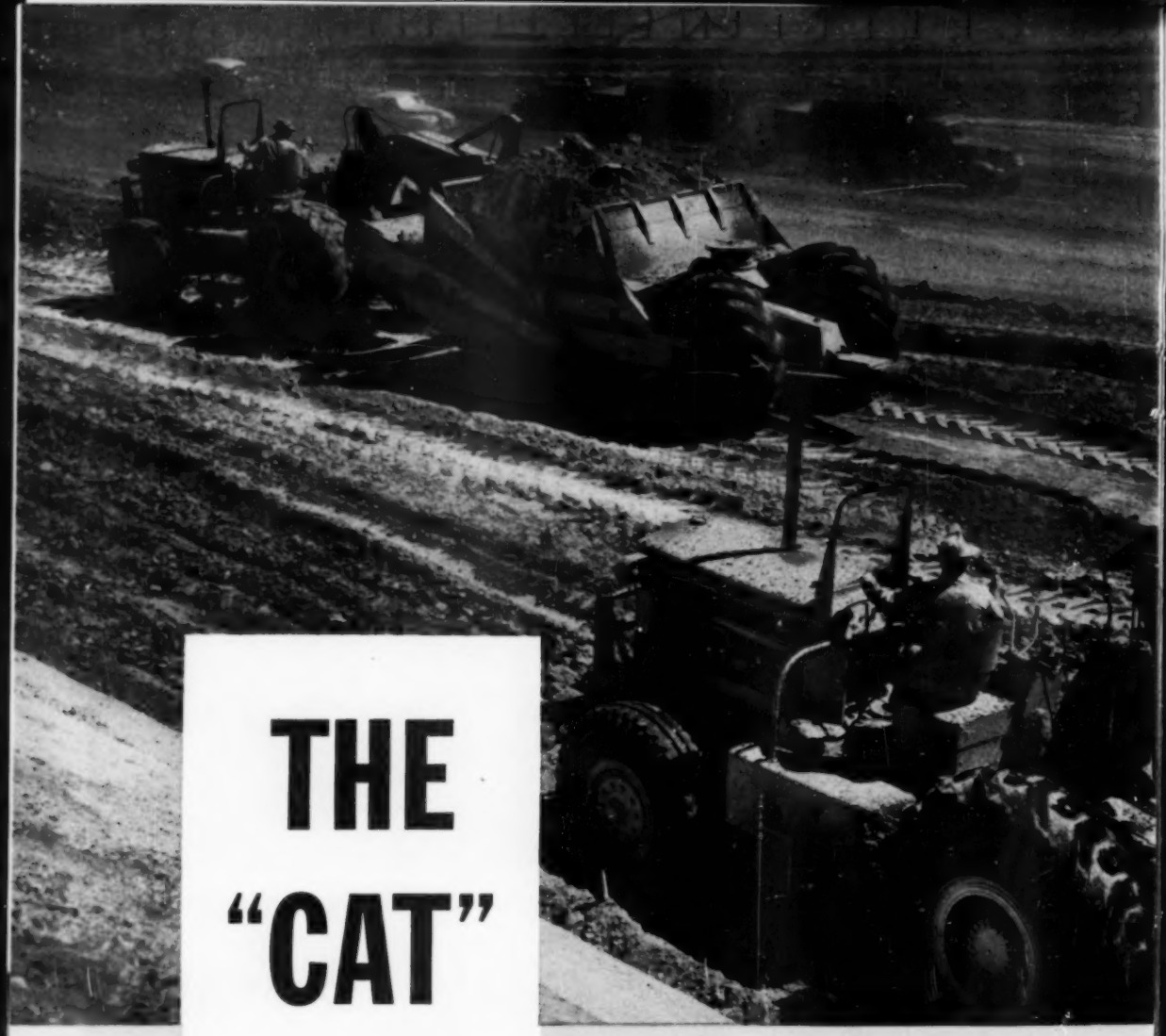
More than 30 service vehicles are in daily use to keep the Stewarts and Lloyds mines supplied with expendable stores and to provide transport for maintenance engineers and their equipment as well as some mobile labor gangs.

Mining Tradition

Management of the mines is carried out by men who have either spent their entire working life with Stewarts and Lloyds, or have been brought in to maintain the company's exacting standard of employing the best brains in the British excavating industry.

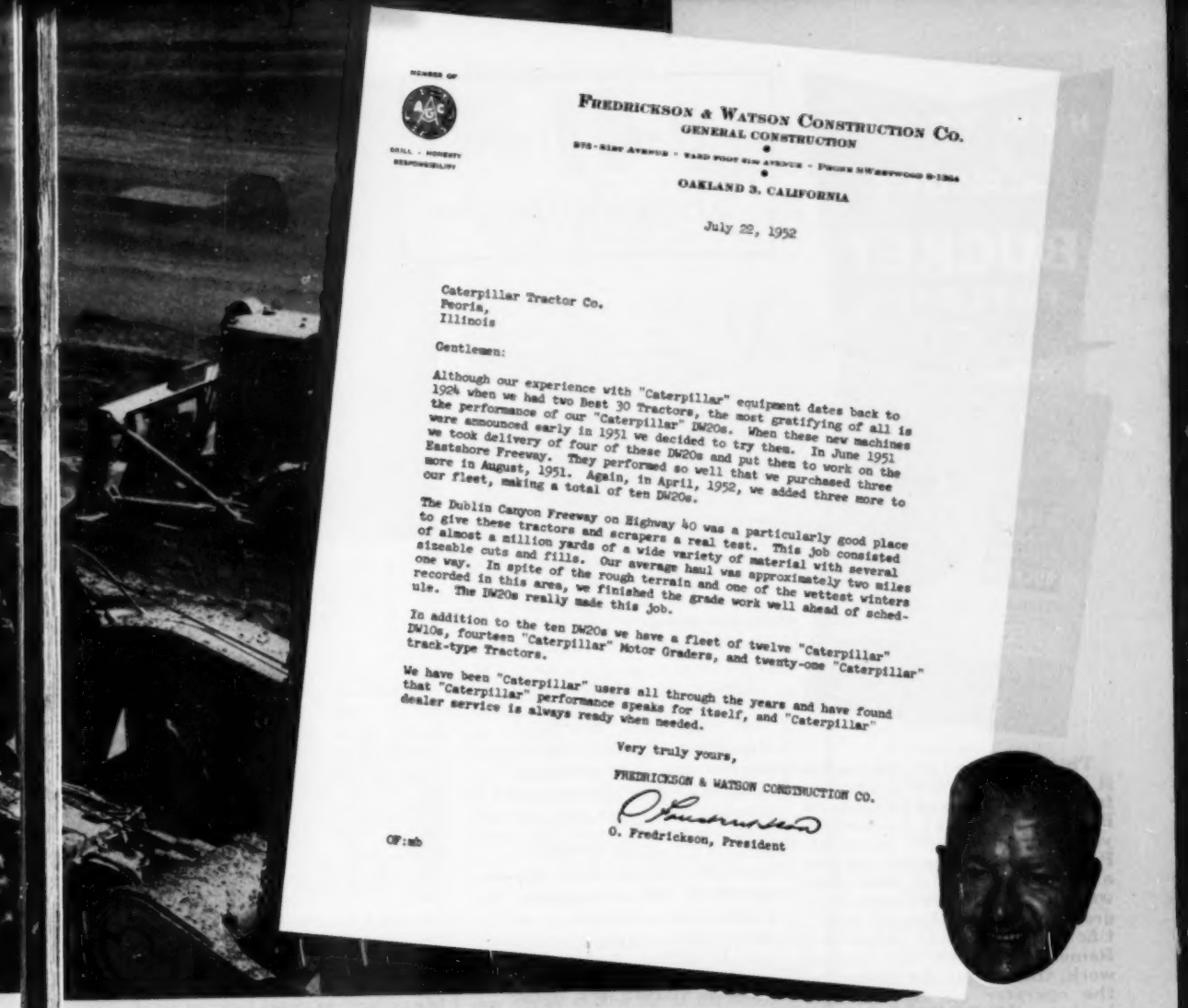
The executive staff work in Brigstock Manor, ancient seat of a long line of nobles, which provided hospitality to King Henry II when "grubbing for ore" was an occupation, back in the days of chain mail and armour.

Hospitality is still a heartwarming feature of the 800-year-old manor, and visitors from the United States who are invited to look over the company's ore field and the parent company's plant will take home pleasant memories of the occasion.



THE "CAT" DW20

ITS RECORD SPEAKS FOR ITSELF!



MEMBER OF

SKILL · HONESTY
DEPENDABILITY

FREDRICKSON & WATSON CONSTRUCTION CO.
GENERAL CONSTRUCTION

8715 - 81st AVENUE · YARD 9001 81st AVENUE · PHONE NEWBERRY 9-1304

OAKLAND 3, CALIFORNIA

July 22, 1952

Caterpillar Tractor Co.
Peoria,
Illinois

Gentlemen:

Although our experience with "Caterpillar" equipment dates back to 1924 when we had two Best 30 Tractors, the most gratifying of all is the performance of our "Caterpillar" DW20s. When these new machines were announced early in 1951 we decided to try them. In June 1951 we took delivery of four of these DW20s and put them to work on the Eastshore Freeway. They performed so well that we purchased three more in August, 1951. Again, in April, 1952, we added three more to our fleet, making a total of ten DW20s.

The Dublin Canyon Freeway on Highway 40 was a particularly good place to give these tractors and scrapers a real test. This job consisted of almost a million yards of a wide variety of material with several sizeable cuts and fills. Our average haul was approximately two miles one way. In spite of the rough terrain and one of the wettest winters recorded in this area, we finished the grade work well ahead of schedule. The DW20s really made this job.

In addition to the ten DW20s we have a fleet of twelve "Caterpillar" DW10s, fourteen "Caterpillar" Motor Graders, and twenty-one "Caterpillar" track-type Tractors.

We have been "Caterpillar" users all through the years and have found that "Caterpillar" performance speaks for itself, and "Caterpillar" dealer service is always ready when needed.

Very truly yours,

FREDRICKSON & WATSON CONSTRUCTION CO.

O. Fredrickson, President

OF:mb

JUNE, 1951
Fredrickson & Watson Construction Co. bought four "Cat" DW20 Tractors with No. 20 Scrapers. **4**

AUGUST, 1951
Fredrickson & Watson Construction Co., satisfied with their first four, bought three more. **3**

APRIL, 1952
Fredrickson & Watson Construction Co., satisfied with their first seven, bought three more. **3**

TOTAL 10

This is the repeat-purchase record of one company. It is typical of countless more. It will pay you to see your "Caterpillar" Dealer *now*.

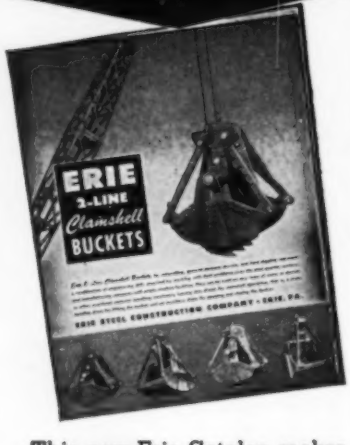
CATERPILLAR, PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

HOW TO GET
Larger
BUCKET
PAYLOADS



This new Erie Catalog makes it possible to quickly choose, from the 4 classes of Erie 2-Line Buckets, the right bucket for *your* crane and material. Perhaps your crane can operate a larger bucket, for Erie alloy welded steel buckets result in greater payloads through scientific bucket weight reduction. Remember, that on bucket work, the cost of the crane and the operator all ride on the bucket. Send for this helpful catalog or outline your conditions and our engineers will make recommendations.

Write for Catalog **2L-1** *Today*

ERIE
STEEL CONSTRUCTION COMPANY
4211 GEIST RD., ERIE, PA

Navy Trains Shovelrunners

• Here is the "classroom" of crane operation at U. S. Navy construction school at Port Hueneme, Calif. Students spend three weeks on cranes.
Official U. S. Navy Photographs.

DURING World War II, the Seabees was made up principally of petty officers. Ratings were established at the time of enlistment because the majority of petty officers had worked in construction trades and had practical experience in civilian life and the navy had no comparable petty officer rates. At the end of the war, most of these men returned to their civilian occupations.

As early as the fall of 1945, the Bureau of Yards and Docks saw the need of training regular naval personnel to replace these skilled craftsmen and established what is now U. S. Naval Schools, Construction, at Port Heuneme, Calif.

Most of the personnel coming into the Seabees today are young men fresh from "boot" camp, with little or no construction experience. The training program of U. S. Naval Schools, Construction (NAVSCON) is designed to introduce them to the basic principles of the construction trades. The watchword of the schools is "learn by doing." This program covers apprentice training for drivers, construction electrician mates, steelworkers, utilities men, builders, surveyors, and draftsmen. In addition, advanced courses for experienced construction personnel are conducted in all schools except surveyor. The primary courses are 13 weeks in length. The advanced courses are presented for a period of 15 weeks. Approximately 25% of school time is spent in the class room, remaining time being spent in practical training.

Driver schools conduct basic training in the operation and preventive maintenance of trucks, crawler tractors with attachments, clamshells, self-powered scrapers, cranes with attachments, graders, and well drilling rigs. Each student gets from 10 to 15 hours of operating time on each type of equipment.

The advance course covers self-propelled scrapers, rock crushers, draglines, shovels, hoes, trenchers and other special construction equipment. The course is divided into one week sections, each section covering one type of equipment or operation. Equipment is assigned to students at the beginning of the week and they are responsible for "their" equipment.

Basic driving instruction is given on 6x6 2½-ton military cargo trucks. Many students who have never been "behind a wheel" learn to drive in the first week of truck school.

After a thorough indoctrination in special safety procedures, hand signals, and operating practices, the class begins crane operation. The first few days are devoted to light hoisting and manipulation of controls. A week of clamshell work follows; then a week of heavy hoisting work into blind areas guided only by hand signals finishes the section. In all, students service, lubricate, and operate 12 makes and models of cranes during this three-week period.

Recruits with little or no experience are made into apprentice construction men by the Navy Seabees.

Principles of earth moving are introduced during a week of lecture and field layout covering grade stakes, terminology, and surveying. This is followed by three weeks of earthmoving operations with crawler tractors. Caterpillar D7 tractors equipped with

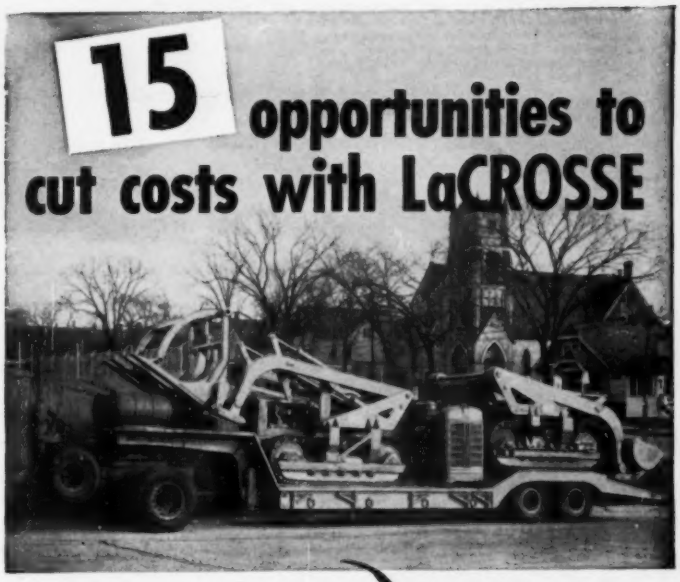
• This annual scene provides an extra sensation for all students present. In this yearly test the cranes are loaded to their tipping capacity.

cable operated dozers are used for the introduction to crawler tractors. After students have the "feel" of the tractors, they are shifted to Caterpillar D8's with hydraulic dozers for another week of dozer operation. The third week is spent on scrapers pulled by Allis-Chalmers HD14's. By this time the class is skilled enough to construct an earth dam or road.

Where there is construction there must be water and many times the Seabees must provide their own. To be prepared for this eventuality, student drivers are trained in the principles and terminology of well drilling.

Graduates of the basic drivers course are not equipment operators, however, they have learned the principles of operation and are now ready to begin actual field experience.

15 opportunities to cut costs with LaCROSSE



If you operate any of the 15 types of equipment listed at right, you'll be time and money ahead with a dependable La Crosse trailer. Saves up to 4 hrs. waiting time for a rental unit on every move . . . permits better scheduling of work . . . keeps major equipment and crews busy for higher earnings. There's a job-proved La Crosse trailer for every hauling need—6 to 67 tons capacity . . . single, dual or tandem axle . . . flat, drop or tilting platform. Write today for free literature, prices and delivery information.

LC-23

- ☐ Asphalt Finishers
- ☐ Bulldozers
- ☐ Cranes
- ☐ Excavators
- ☐ Generators
- ☐ Graders
- ☐ Hoist Equipment
- ☐ Pavers
- ☐ Rippers
- ☐ Rollers
- ☐ Snow Plows
- ☐ Stationary Machy.
- ☐ Transformers
- ☐ Trenchers
- ☐ Tool Houses

Check Today!

LA CROSSE TRAILER CORPORATION, La Crosse, Wis.

☐ Rush complete information on La Crosse trailers:
☐ Specifications ☐ Prices ☐ Delivery
☐ Send name of nearest La Crosse Distributor.
☐ We may buy a ..... ton trailer about ..... (date)

Name.....Title.....
Employed by.....
Address.....
City.....State.....

LaCROSSE
America's Favorite LOW BED TRAILER

Big

ESTABLISHING MOUNTAIN-TOP BASE, a helicopter and a TD-24 put men, machinery and supplies on mile-high pass as first step in efforts to build road down to meet section coming up from each side. TD-24 pulled yarder, winch, and compressor into pass after bitter 7-day fight.

1 RAISING KENNEY DAM to fill the Grand Canyon of the Nechako River, workers sluice down some of the 3.8 million cubic yards of earth and rock it will eventually contain. Dam will form a reservoir with twice the capacity of Grand Coulee. TD-24 in foreground strips blasted rock from canyon wall abutment.

2 HEADING OPERATIONS at Kenney Dam are (left to right) Alcan Resident Engineer Harry Jomini; General Superintendent "Hak" Nielsen and Project Manager Jack Bremner, both of Mannix, Ltd., sub-contractor for Morrison-Knudsen Company of Canada, Ltd. 110 miles west, dammed-up waters will be diverted through mountains and dropped a half mile to run turbines in sea-level powerhouse.

3 DRIVING TEN-MILE TUNNEL through mountain is done from four headings. Here, half a mile above ocean-level valley, aerial tramway has delivered TD-24 to tunnel portal for working debris down mountain. 2,600 feet below, eight-story powerhouse inside mountain is being mucked out by a TD-24 and a TD-9.

Red TD-24 Pioneers New Frontier

59 International TD-24s spearhead largest integrated engineering program in history for Alcan (Aluminum Company of Canada, Ltd.) on Project British Columbia

A fleet of 59 hard-hitting International TD-24s is blazing a new frontier across 5,000 square miles of wilderness in British Columbia.

Twenty-four hours a day, they're on the go for Morrison-Knudsen Company of Canada, Ltd., prime contractor for most of the giant development that includes:

Building the largest sloping clay core dam in the world

Driving a subway-size tunnel ten miles through a mountain

Blasting out an eight-story powerhouse two blocks long inside solid rock

Erecting a transmission line fifty miles long over a jagged mountain range

Raising the world's largest aluminum smelter and a new port city at Kitimat where 50,000 people may eventually live and work.

A. O. Strandberg, project manager for Morrison-Knudsen, says:

"These TD-24s are doing the impossible. We never thought any tractor could go where these tractors are working now. They have the weight, they have the balance, and they have the power to get the job done."

And here's what superintendents on the firing line say:

Bill Richards: *"They're pushing boulders uphill we had to dynamite in the old days."*

Herb Wilkinson: *"I wouldn't believe where they'd go until I got them on my crew."*

John Hutton: *"They're doin' work up here they were never built for but they're doin' it just the same."*

Your International Industrial Distributor can give you the facts and figures on the TD-24. See him. You'll be a TD-24 man from then on in!

INTERNATIONAL HARVESTER COMPANY • CHICAGO 1, ILL.

INTERNATIONAL HARVESTER

INTERNATIONAL

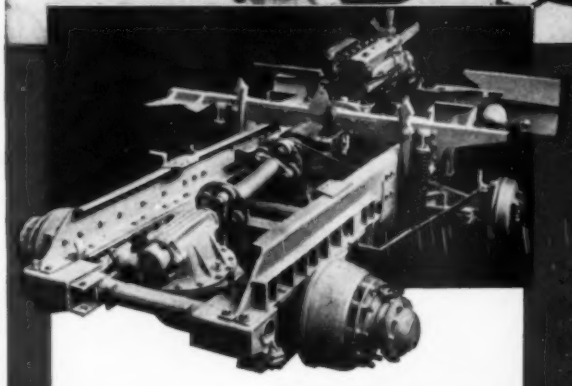
POWER THAT PAYS

4 **INSPECTING MOUNTAIN TOP OPERATIONS** at Kemano, headquarters for construction of powerhouse, tunnels and transmission line are (left to right) A. O. Strandberg, Project Manager for Morrison-Knudsen; F. T. Matthias, Alcan Assistant Project Manager, and Walter Abrahamson, Alcan Assistant Resident Engineer at Kemano.

5 **LINKING UP POWER TRANSMISSION LINE ROAD,** a pair of TD-24s doze toward each other through blasted rock. Across 50 miles of rugged terrain like this, a mountain-anchored powerline will be built to flash abundant electricity from mountain powerhouse to smelter at tidewater.

6 **NEW LAND IS MADE IN OCEAN INLET** by dredge which deepens anchorage for ocean shipping at the same time. H. M. Whiting (right), Project Manager for Kitimat Constructors, Ltd., and a superintendent study progress. Part of this 70 acres of new land will become site of new aluminum smelter. Town which may eventually become city of 50,000 will be built across the bay.

Strength with FLEXIBILITY



ENGINEERED for DURABILITY

This is a chassis built to stand up to the worst conditions which construction work can offer and will save dollars on maintenance and repair, just as the instantaneous gravity tip action saves time on the job.

MASSIVE DESIGN RUGGED CONSTRUCTION

EQUALLY AT HOME ON ROAD OR SITE

There is no Dumper in the world like this British-built Muir-Hill 4½ yarder. Over twenty years know how is built into this—the most advanced unit in its field. Just off the press is a new Muir-Hill publication giving the whole story. Write us today for a free copy.

MADE TO MUCH MORE

The Muir-Hill 14B MODEL 4½ CU. YD. DUMPER

E. BOYDELL & CO. LTD., OLD TRAFFORD, MANCHESTER 16

Cables: **'Muirhil' Manchester 16, England**

dm EB 194

News from the Field

New British Diesels Seek U. S. Market

Sir Percy Lister, one of five brothers who are joint directors of a British foundry firm, is spending several weeks in the United States and Canada, introducing a new range of Diesel engines. These are the Lister "Freedom" Diesel engines, probably the first Diesels made in Britain to embody the unified thread system interchangeable between the United States and the United Kingdom. At present they are being turned out in Britain at the rate of 400 per month by the firm of R. A. Lister and Co. Ltd., of Dursley, Gloucestershire, England.

The "Freedom" series consists of a range of 1, 2, 3, 4, and 6 cylinder high speed oil engines suitable as prime movers in a great variety of trades and industries, from tar spraying and road rolling to quarrying and excavating. With the exception of the single cylinder, the engine develops 9 hp at 1,800 rpm or 8 hp at 1,500 rpm, and is thus suitable for coupling to alternators of 60 and 50 cycles.

During the past year, sales and service personnel from Lister's overseas organization have visited Dursley to undergo a special instructors' course in the engine. This will permit the establishment of instruction schools in many countries, including the U.S.

During his visit to America, Sir Percy supervised the exhibition of the engine at the recent International Trade Fair at Toronto.

Underground Gas Storage Approved in Illinois

In a move it described as bringing Illinois residents closer to the day when they can get all the gas they want for space heating and other uses, the Illinois Commerce Commission approved a plan to store 150 million cubic feet of natural gas in a rock dome 1,500 feet underground in Kankakee County.

A commission spokesman pointed out, however, that the plan still had to pass Federal Power Commission scrutiny. The federal agency, he said, has to decide if it has jurisdiction in the matter and whether it will approve or reject it.

The plan calls for piping gas into the natural dome during summer to meet the huge winter demand. It is sponsored by the Natural Gas Storage Co. of Illinois, owned by the Natural Gas Pipeline Co. and the Texas-Illinois Natural Gas Pipeline Co. The two companies now supply natural gas to local utilities serving 1.5 million customers in 291 communities, mostly in northern Illinois.

Receiving about 10,000 space heating applications a month, these utilities expect to have an estimated 250,000 applications by the end of 1953. By that time 90,000 more customers will be served by normal pipeline supply, but the other 160,000 applicants will depend on underground supply for space-heating gas.

"Safety hazards in the proposed project," the commission said, "will be substantially less than those incident to operation of natural gas production fields and to storage of gas above ground."

Nevertheless, the commission ordered the company to take these precautions: Install a well designed to check levels and pressures of water used to seal the gas supply; keep pressure below 1,200 psi although witnesses said any pressure below 1,700 would be safe; and, post public liability insurance in the amount of $500,000.

Ocean-Going Ore Fleet Expanding Rapidly

A fleet of seagoing iron ore vessels, backed by American steel and ore companies, is being rapidly expanded to carry the steadily increasing imports of iron ore into this country. The information was received in an August report from the American Iron and Steel Institute.

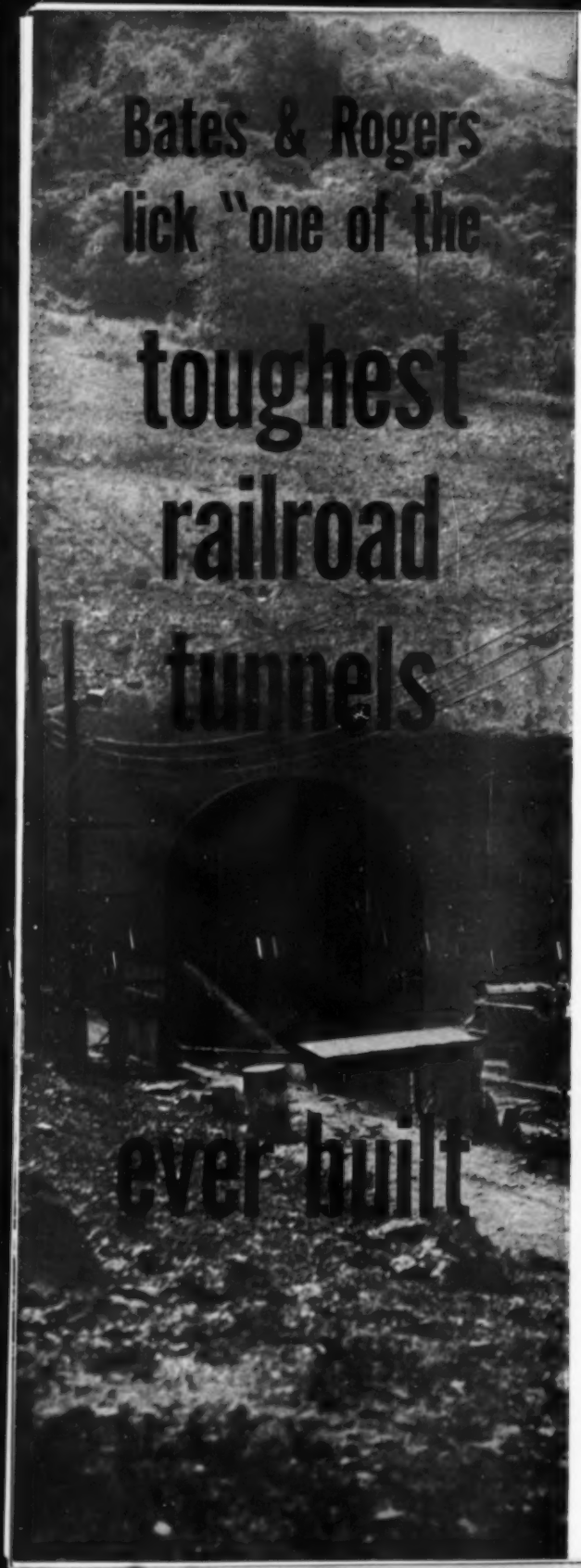
Eight new ore vessels have been built in the United States since 1945 to replace the five sunk by enemy submarines during World War II. There are now 10 ships bringing iron ore regularly from Chile and Venezuela. (An article on long-haul ore, "2300 Miles from Pit to Hearth," was published by *Excavating Engineer* in the August, 1951 edition.)

Two vessels to carry Liberian ore from Monrovia to Baltimore were christened in Scotland in 1951. At least two carriers are being built to transport Quebec-Labrador iron ore out of the port of Seven Islands. Still more vessels are planned for importing ore.

The fleet's operation suffered a setback during the steel strike. At one

Continued on page 38

• Chicago's heavily-traveled Michigan avenue bridge has been cushioned with millions of tiny rubber pellets to absorb impact of more than 50,000 cars and buses which pass over roadway daily, thus adding to road life. Developed by The Goodyear Tire & Rubber Co., Akron, O., this synthetic rubber material is being used also as playground surfacing to reduce recreational injuries.



Close-up shows Tournarocker getting last dipperful from 2-yd. tunnel shovel. Rigs were loaded with 7 pay yds. in average of 4 passes. On typical 3600′ haul, each "D" removed 4 loads per 50-minute hour.

Bates & Rogers Construction Corp., of Chicago, really ran into trouble while digging a 3226′, 200,000 cu. yd. tunnel for the B. & O. main line just east of Clarksburg, West Virginia. About 1218′ in, they intercepted an abandoned coal mine. What had started as a routine job became what Editor Harold W. Richardson, writing in Construction Methods & Equipment, called "one of the toughest railroad tunnels ever built". To lick it, the contractors had to use every trick in their book of tunneling experience.

"D's" turn easily in 31′ space . . . trucks need skid plate

For removing muck and shale, they teamed a bob-tailed 2-yd. shovel (with shortened boom and dipper stick) with two 10-yd., rear-dump D Tournarockers and two 10-yd., rear-dump trucks. The 2 Tournarockers, with their 12′9″ turning radius, easily turned around inside of the 31′ wide tunnel . . . backed through a 3½-deck jumbo to load at shovel. "In the murky light," wrote Richardson, "this is one of the neatest tricks we've seen in maneuvering heavy equipment."

By comparison, the conventional trucks had to run their front wheels up on a steel skid plate, then have their front ends dragged around by an air hoist.

Performance earns order for 6 more LeTourneau rigs

Though the 2 "D's", on typical 7200′ cycles, removed only 56 pay yds. every 50-minute hour . . . their performance under the adverse conditions was so impressive that Bates & Rogers have since ordered and taken delivery on 3 more LeTourneau "D's" and 3 C prime movers with scrapers.

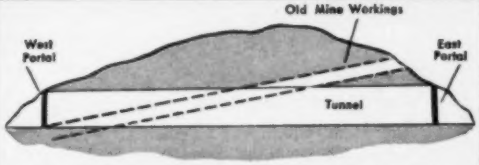
If *you've* got a tough hauling job coming up . . . better check Tournarocker's production advantages for yourself. Ask your LeTourneau Distributor to show you additional field reports on these highly-maneuverable 9-ton Rear-Dump Haulers. He can also arrange a demonstration on your job, if you want one.

R. G. LeTOURNEAU, INC.

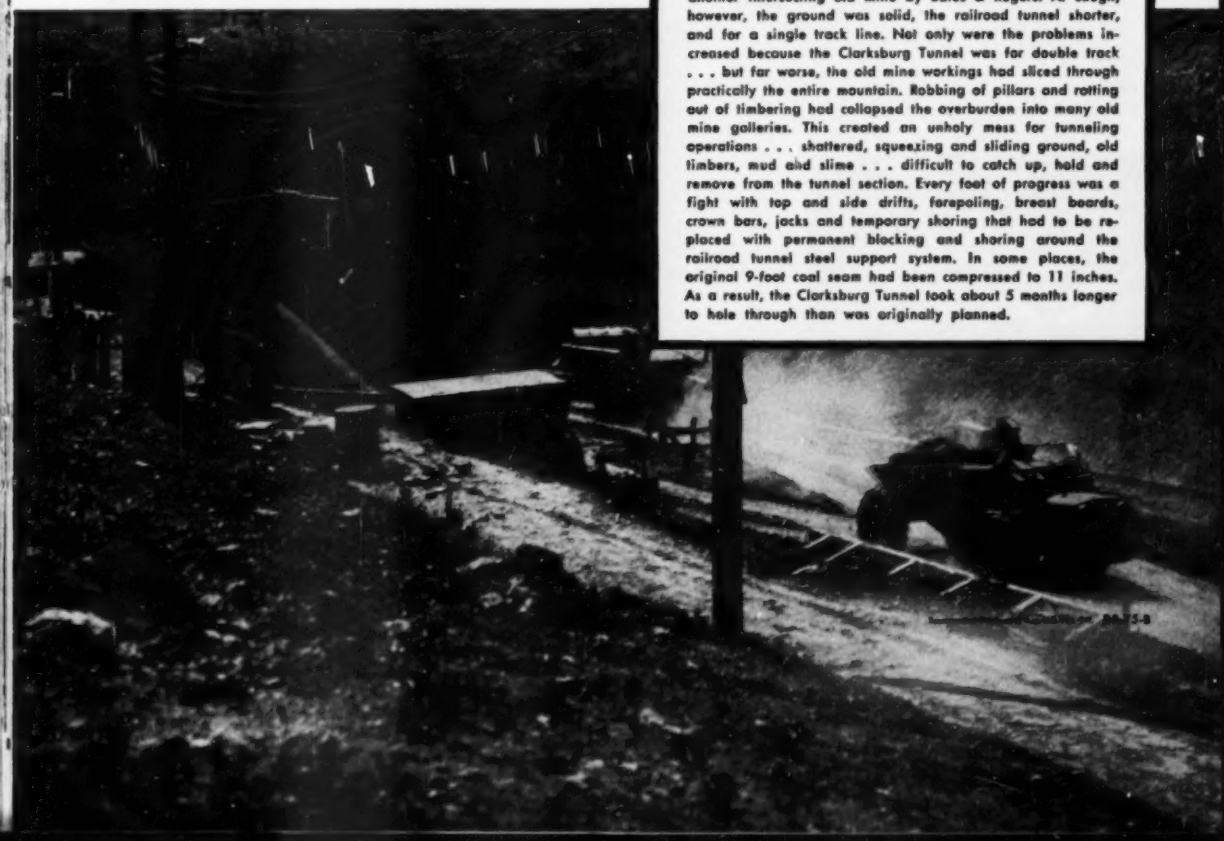
Peoria, Illinois

Tournarockers made entire cycle under own power . . . trucks were turned by auxiliary power and, at times, had to be pushed through the sludge which accumulated on the tunnel floor.

While conventional rear-dumps require turntable to reverse direction in the narrow tunnel, Tournarockers easily turn under own power . . . back through jumbo to shovel, load (as shown), and haul away.



Old maps showed the abandoned mine workings intercepting the projected Clarksburg Railroad Tunnel at roof level 1200 to 1300' from its east portal, and continuing to slope downwards to invert level at its west portal. Though core borings could reveal little, job was expected to be similar to the B. & O. Lough Tunnel, driven successfully and rapidly through another intersecting old mine by Bates & Rogers. At Lough, however, the ground was solid, the railroad tunnel shorter, and for a single track line. Not only were the problems increased because the Clarksburg Tunnel was for double track . . . but far worse, the old mine workings had sliced through practically the entire mountain. Robbing of pillars and rotting out of timbering had collapsed the overburden into many old mine galleries. This created an unholy mess for tunneling operations . . . shattered, squeezing and sliding ground, old timbers, mud and slime . . . difficult to catch up, hold and remove from the tunnel section. Every foot of progress was a fight with top and side drifts, forepoling, breast boards, crown bars, jacks and temporary shoring that had to be replaced with permanent blocking and shoring around the railroad tunnel steel support system. In some places, the original 9-foot coal seam had been compressed to 11 inches. As a result, the Clarksburg Tunnel took about 5 months longer to hole through than was originally planned.



Continued from page 35

time, 10 seagoing ore vessels loaded with about a quarter of a million tons of high grade iron ore, were reported tied up in Chesapeake Bay, unable to discharge their cargoes.

The newer salt water ships have a cargo capacity of more than 24,000 tons. However, the Great Lakes ore boats can carry more over a long period of time because of the shorter distance they have to travel, and the greater number of round trips possible. Typically, the deep sea vessels take 12 days "cargo-out to cargo-out" for Venezuelan ore; 24 days on the run to Chile and back; 25 days on the round trip for Liberian ore—as compared with the 4½ to seven days required to take ore from the head of the Lakes to Lower Lake ports, and return.

● Here's a reminder of things to come — cold weather, snow and then the problem of snow removal. This scene of last winter was taken at Gunnison County, Colo. airport. The Caterpillar Diesel No. 12 motor grader is equipped with a Domar rotary snow blower.

US Firms Reconstruct War-Ravaged Mine

Machinery and equipment supplied by more than 25 American firms has enabled reconstruction of a war-devastated Norwegian iron mine into a substantial source of ore for the iron-hungry defense industries of the free world.

The mine and its plants, which were completely destroyed by the Nazis in 1944, are now back in production and are expected to turn out a million tons of iron ore concentrates annually by next year. The project was financed under the Marshall Plan and the Mutual Security Program. The 500,000 tons of ore concentrates expected to be produced in nine months' operation this year will have an estimated value of about $6.5 million, or approximately twice the dollar amount thus far invested.

The U. S. suppliers, large and small manufacturing firms in at least 10 states, from Massachusetts to California, provided numerous key items. The principle suppliers have been:

Calif.: Ray Oil Burner Co., San Francisco.

Conn.: National Filter Media Corp., New Haven.

Ill.: R. G. LeTourneau, Inc., Peoria; Caterpillar Tractor Co., Peoria; The Buda Co., Harvey.

Mass.: Worthington Pump & Machinery Corp., Holyoke works.

Minn.: Electric Machinery Manufacturing Co., Minneapolis; E. J. Longyear Co., Minneapolis.

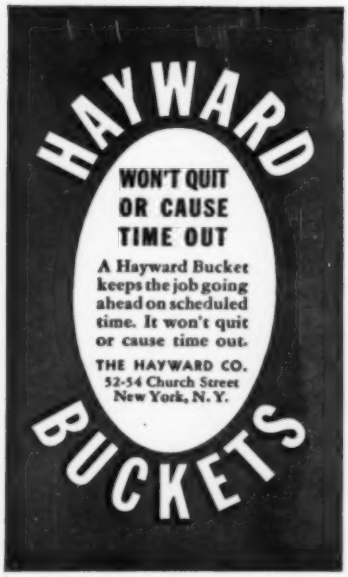
N. J.: Merrick Scale Manufacturing Co., Passaic.

N. Y.: Ingersoll-Rand Co., NYC; Ore. & Chemical Corp., NYC; Hoyland Steel Co., Inc., NYC; Independent Pneumatic Tool Co., NYC.

O.: Euclid Road Machinery Co., Cleveland; The B. F. Goodrich Co., Akron; Willys-Overland Motors, Inc., Toledo; Firestone Tire & Rubber Co., Akron; Goodyear Tire & Rubber Co., Akron; The W. S. Tyler Co., Cleveland.

Pa.: Westinghouse Electric Corp., Pittsburgh; Ajax Electric Co., Inc., Philadelphia; Fischer & Porter Co., Hatboro.

Wis.: Bucyrus-Erie Co., South Milwaukee; Nordberg Manufacturing Co., Milwaukee; Four Wheel Drive Auto Co., Clintonville; The Falk Corp., Milwaukee; Dings Magnetic Separator Co., Milwaukee.


HAYWARD
WON'T QUIT
OR CAUSE
TIME OUT
A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.
THE HAYWARD CO.
52-54 Church Street
New York, N. Y.
BUCKETS

Lavers Joins Ebasco

Ebasco Services Inc., engineers, constructors, and business consultants, announced that W. Douglas Lavers has joined the firm as construction manager. Lavers will be responsible for construction projects outside of the United States.

Lavers comes to Ebasco from Union Carbide and Carbon Corp. where he was plant manager of the electromagnetic plant for the separation of uranium isotopes at Oak Ridge, Tenn. Prior to that he was engaged in construction of the Norris, Chickamauga, Kentucky, and South Holston dams. He was assistant construction engineer and acting project manager on the South Holston project.

A native of Nova Scotia, Lavers is a graduate of Northeastern University in Boston. He is an associate member of the American Society of Civil Engineers.

Name Pittsburgh Man to Head Mine Safety Work

James Westfield of Pittsburgh, a mining engineer with 24 years service in the Bureau of Mines, recently was named chief of the bureau's Health and Safety Division in Washington, D. C.

In announcing the appointment, Secretary of the Interior Oscar L. Chapman also said W. H. Tomlinson of Vincennes, Ind., a former Pittsburgh resident, is being transferred back to the steel city to fill the va-

GM DIESEL
CASE HISTORY No. 526-25
USER: Aurora Limestone Products Co., Aurora, Iowa, producers of road stone and agricultural lime.
INSTALLATION: GM 3-71 Diesel powers a ¾ yd. Unit shovel, replacing a ¾ yd. shovel powered by a gasoline engine.
PERFORMANCE: GM Diesel powered shovel works faster, feeding crusher about 17% more per day. Fuel consumption averages 4 gallons per hour, saving 33% on operating costs.

THIS DIESEL LOADS FASTER

and costs 1/3 less to operate

A few days after Aurora put this shovel to work, they rented a 2-cycle General Motors 6-110 Diesel for their portable crusher while the old 4-cycle Diesel was in for overhaul. Production increased from 600 tons per day to 800 tons. Fuel costs dropped from $14.00 per 10-hour day to $9.80. No-dies to say, the 6-110 now powers the crusher with power on every piston down-stroke. Fast accelerating GM Diesels enable equipment to do more work each day. They're quick starting—easy to service and cost less to maintain. That's why users tell us "any machine with GM Diesel power is a better machine." Specify GM Diesels for your equipment.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN

It pays to Standardize on

GM
GENERAL MOTORS
DIESEL POWER

TRACTION

You can trust

4-wheel drive PAYLOADER®

It takes traction in all kinds of going to get jobs done on schedule . . . traction you can rely on the year 'round . . . that handles big loads quickly, easily and economically.

Hundreds of contractors and public works departments own Model HM "PAYLOADERS" . . . a large percentage have placed repeat orders proving their satisfaction with the traction, flotation and all-around utility of this unusual wheeled tractor shovel. They also value its ability to get to the job fast under its own power . . . the way it can do so many jobs — dig, load big hauling units, bulldoze, spread, back-fill, carry, lift, lower, pull and push.

Operators like its ease of operation, thanks to power-boosted steering, fingertip hydraulic control, the quick, easy shift between the four forward speeds and four reverse speeds. Once you see the Model HM "PAYLOADER" in action you'll want one too, so see your "PAYLOADER" Distributor or write The Frank G. Hough Co., 708 Sunnyside Avenue, Libertyville, Illinois.

WRITE for catalog on the 1½ yd. Model HM or the six other "PAYLOADER" sizes down to 12 cu. ft. bucket capacity.

PAYLOADER®

THE FRANK G. HOUGH CO. • SINCE 1920

cancy created by Westfield's promotion. Tomlinson, also a mining engineer, will head the Accident-Prevention and Health Division in the bureau's northeastern region where 85% of the nation's coal is produced.

Tomlinson, who joined the bureau six months after Westfield, began working in Pennsylvania coal mines in 1910 when 14 years old. He attended night school for many years to qualify as a mining engineer.

In his new post in the nation's capital, Westfield assumes the position held by J. J. Forbes, another former Pittsburgher, who became director of the Bureau of Mines last November. Westfield now will be responsible for the bureau's far-flung efforts to increase safety and improve health conditions in the mineral industries of the United States.

The program includes research designed to determine mining hazards and to develop methods of guarding against them, training officials and employees in the nation's mines and mineral-processing plants in accident prevention and first-aid and mine-rescue procedures, and administration of an augmented program of coal-mine inspections by the government.

Westfield was born in Utah, is a mining engineering graduate of the University of Utah, and has wide experience in rescue and recovery work at coal-mine and metal mine disasters. The new chief of the Health and Safety Division is the author of many bureau reports on safety methods and inreau reports on safety methods and investigative work in the accident-prevention field. One of his most recent assignments found him joint author of the disaster report on the Orient No. 2 mine explosion at West Frankfort, Ill., in which 119 men lost their lives. Westfield assisted in recovery work following that disaster.

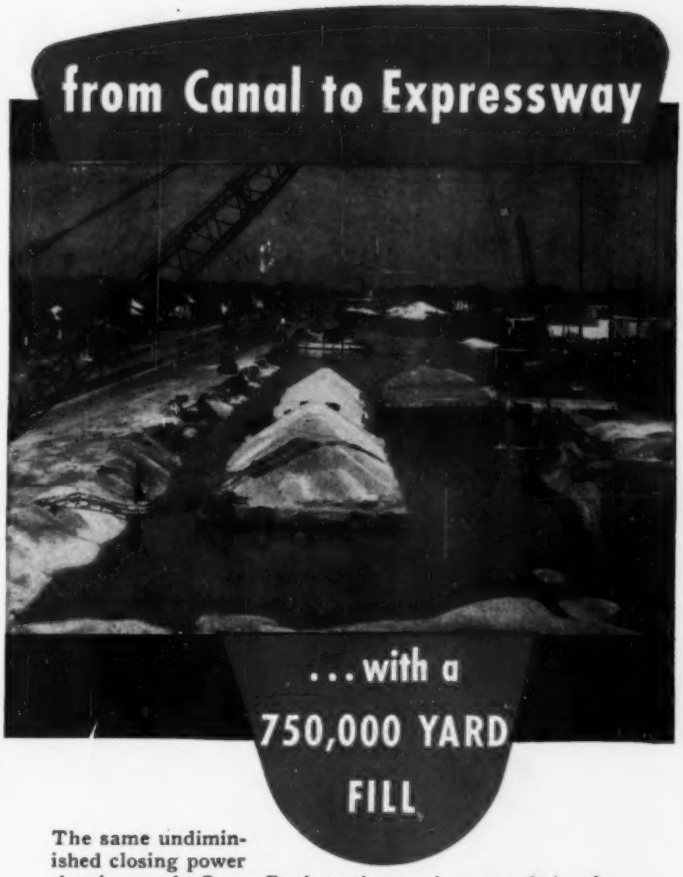
Goodyear Cuts Prices

Goodyear Tire & Rubber Co. announced recently that lower list prices are in effect on most of its types and sizes of truck tires.

These reductions range from 2.5 on small truck tires to 7.5% on the larger sizes. All automobile and truck tubes will be reduced 5%.

There are no reductions at this time on prices of automobile and farm tires for the reason that, although there has been some reduction in the price of natural rubber, this does not greatly affect production costs of automobile or farm tires which contain from 75 to 85% synthetic rubber.

For the same reason, there is less reduction in smaller sizes of truck tires which require less natural rubber.



The same undiminished closing power that has made Owen Buckets the number one choice for difficult "digging" is incorporated in rehandling buckets with larger, wider opening shells that take tremendous grabs in sand, gravel, refill earth and other loose materials.

Expert engineering utilization of this Owen principle of power application, based on unprecedented specialized experience, has made Owen the first and best known name wherever grab buckets are used.

Outstanding performance was doubtless a factor in selecting Owen buckets for this tremendous filling operation being handled at New Orleans by Jahncke Service, Inc. They'll do a job for you, too. Get the Owen Catalog.

BUCKETS AND GRAPPLES
Write for Catalog

THE OWEN BUCKET CO.
3099 Breakwater Avenue • Cleveland, Ohio

Why you're WAY AHEAD with BUCYRUS ERIE Matched Equipment

Designed as a Team— Bucyrus-Erie equipment for the TD-24 was developed right along with this modern tractor — every unit has matched characteristics of weight, size, capacity and balance to take fullest advantage of its power.

Wide Choice to Fit Your Needs— A complete line of equipment for the TD-24 is offered you by Bucyrus-Erie. Here you will find just the right working combinations to fit you needs.

Backed by Unequalled Experience— Each of the units in this broad line is backed by more than 70 years of experience in building tens of thousands of earthmoving machines, and by resources and facilities unique in the industry.

BUCYRUS-ERIE CO., South Milwaukee, Wisconsin

The BIG RED TEAM
BUCYRUS ERIE
Two Big-Capacity Scrapers work with the TD-24: The B-170A with 16-yd. struck capacity is the biggest of scrapers for loading without pusher help. The 22-yd. (struck) B-250 is the largest scraper in current production.
Let Your International Industrial Tractor Distributor give you more reasons why you are ahead with Bucyrus-Erie matched equipment.

for International TD-24 Tractors

Choice of Two TD-24 Blades: The Bullgrader (shown) features three blade positions plus vertical tilt. The Bulldozer has straight across blade position.

Two Power Control Winches: The double-drum rear-mounted P-29 (seen in the scraper view) and the single-drum front-mounted P-15 (shown with the Bullgrader).

The CR-4 Ripper is designed to withstand the power of two TD-24's — one pulling and one pushing.

12T52C

Four Pusher Plates: One mounts directly on tractor frame (shown here). Others mount on Bullgrader frame, Bullgrader blade or Bulldozer blade.

See Your International Industrial Tractor Distributor

Equipment
You Ought to Know About

Front-End Loader

Manufacturer: Dearborn Motors Corp., Birmingham, Mich.

Claims: A new tractor-operated industrial loader, with a lifting capacity of half-a-ton and a lifting height of nearly eleven feet has been added to the company's equipment line. The loader is designed to be operated on the Ford tractor. Two levers give the operator "finger tip" control.

The loader's hydraulic pump is mounted on the tractor rather than the loader itself. This method results in smoother, more positive drive, and enables the tractor to get closer to trucks for dumping the loader bucket.

Another advantage of the separate hydraulic pumps is that the tractor's hydraulic mechanism is left free to operate additional rear-attached tools. For example, you can mount the loader on the front and still attach a blade or angle dozer to the tractor's hydraulic mechanism on the back, for "double duty" operation.

Jaw Crusher

Manufacturer: Pioneer Engineering Works, Inc., Minneapolis 13, Minn.

Claims: A new 10 x 16 in. plain bearing jaw crusher features a single wall pressed steel base that is strong and rigid, and yet lighter in weight. The pitman bearing is a full round bronze sleeve bearing. Side bearings are bronze on the bottom half and babbitt on the top half. Bearings are protected by felt oil seals in each end of each bearing. Reversible jaw plates are of manganese steel. Production capacity will range from 4 to 40 tons per hour, depending on stage of reduction required. The approximate weight of the new crusher is 3,350 pounds.

Widening Blade

Manufacturer: Ulrich Products Corp., Roanoke, Ill.

Claims: A new tool, designed to cut road widening costs is the Domor road widener.

The road widener is a moldboard frame and roller device that is easily attached to the regular Caterpillar motor grader blade. Mounting requires only a few minutes. The rollers guide the plow-like blade along the edge and

lip of the paving. The cutting edge scours the edge of the paving as it cuts a trench to exact specifications. Depth and width of cut are adjustable, to fit each job's requirements. Operation is through the grader controls.

The trench is prepared in four grader passes. The first two are regular blade cuts that remove excess dirt. Then the Domor road widener goes to work and, in two passes, produces a trench that is ready to take concrete without any hand cleaning or labor. The bottom is clean, precision level

BUCKETS AREN'T BORN!
No sir . . . it takes experience to produce a dragline bucket that will do the job . . . take the punishment. Omaha Dragline Buckets are the product of over 40 years bucket building experience . . . they dig in faster . . . fill quicker . . . dump cleaner. Available in four types. Send for complete catalog giving description and specifications.
OMAHA
DRAGLINE BUCKETS
DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

and compacted. The paving edge is clean, providing an excellent bonding surface. No undercutting is required and the pouring of excess concrete, as in previous methods, is eliminated. No forms are needed if not called for in specifications.

All Caterpillar motor graders can be fitted with the road widener which has received a thorough testing on Central Illinois road projects.

Portable Lights

Manufacturer: Winpower Mfg. Co., Newton, Ia.

Claims: Manufacturer is now producing 5,000 watt Nite-Hawk floodlight and power supply units consisting

of a Winpower 5 k.w., 115 volt A.C. generator, powered by a Wisconsin 4 cylinder air cooled engine. Four 80,000 candlepower floodlights are mounted at corners. They can be raised to 8½ feet and aimed in any direction.

Operating equipment includes lighted control panel with duplex receptacles for power tools, for emergency power needs or extensions to separate flood lights. Fused circuits, rheostat voltage regulator, automatic circuit breaker, separate switches for each light, and two built-in, side-mounted tool boxes are other features.

This unit is mounted on a two-wheel, pneumatic-tired trailer with heavy-duty, multiple-leaf, steel springs and retractable caster wheel for parking.

Heating Mat

Manufacturer: United States Rubber Co., New York 20, N. Y.

Claims: A rubber mat with a built-in radiant heating unit has been developed and tested successfully to provide greater comfort for employees who encounter cold working conditions on the job.

A far western coal mine operator, for example, has installed the heaters in coal mine locomotives to warm the feet and legs of the operators. They are also being used in the cabs of cranes and under the feet of machine operators who must stand in cold areas for long periods of time.

On the surface, the heater looks like a high grade rubber floor mat. Its center, however, contains a layer of electrically conductive rubber which constitutes the heating element. It operates on 110-volt current which can be supplied from any lamp socket or baseboard outlet.

Normal operating temperature for the heater is about 35° above the surrounding temperature. This temperature is warm enough to give adequate comfort but not hot enough to feel uncomfortable under foot.

Rubber used in the mat is especially constructed for toughness. The heaters are being marketed under the trade name *Uskon*.

Liquid Extinguisher

Manufacturer: Fyr-Fyter Co., 221 Crane St., Dayton, O.

Claims: A new one and two quart vaporizing liquid fire extinguisher designated as the Pressurized Model B featuring fast, one-hand operation with accurate control is now offered.

Aim, squeeze the grip and a 30-ft. fire-fighting stream is released. The elimination of pumping and other manual operations enables the operator to aim a direct, on-target stream. The vaporizing liquid is completely discharged in 17 to 25 seconds by the positive force of odorless, non-toxic, moisture-free, pressurized nitrogen.

Continued on page 48

DREDGES

HYDRAULIC
DIPPER
CLAMSHELL

Bolted sectional steel hulls for landlocked, inland waters

If you need a dredge, write us!

AMERICAN STEEL DREDGE CO. INC.
FORT WAYNE 1 · INDIANA · U.S.A.

DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905

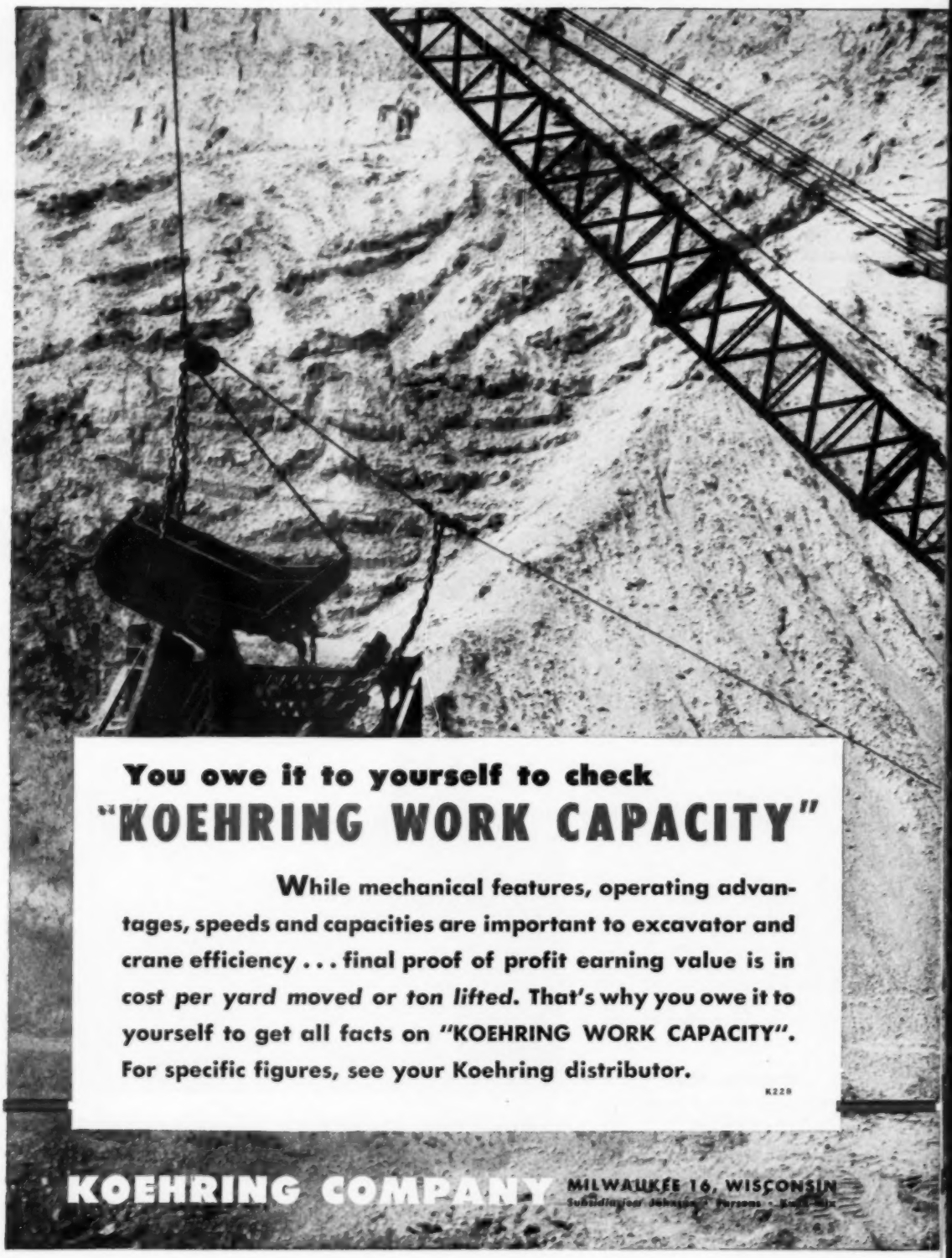
Full power behind both drills with Jaeger air-plus pressure

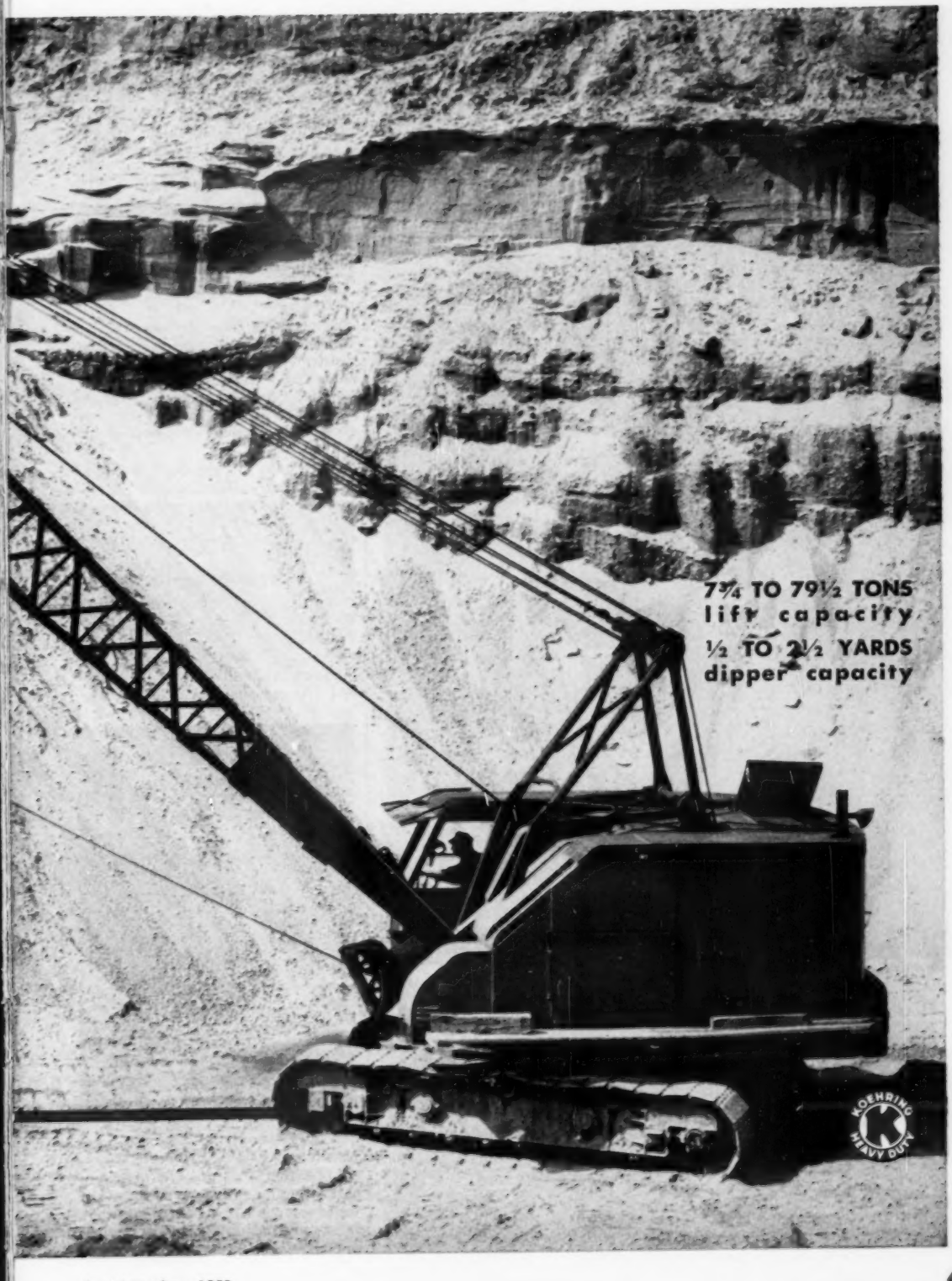
75 ft.
125 ft.
185 ft.
250 ft.
365 ft.
600 ft.

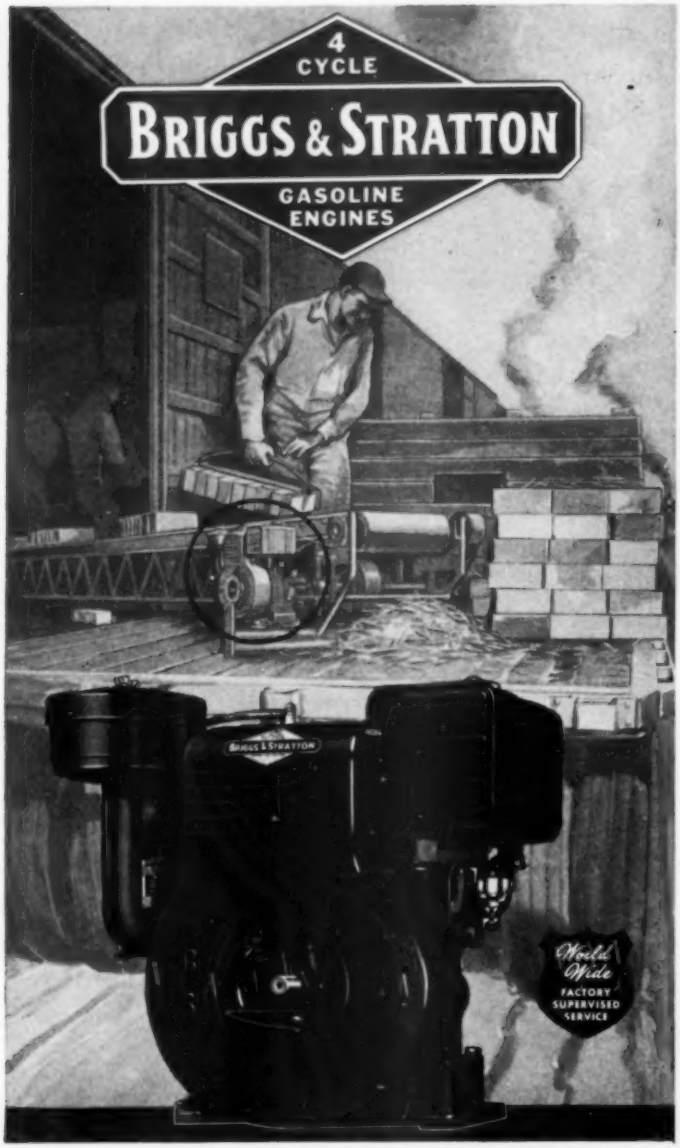
By using a "new standard" Jaeger 365 compressor instead of a 315 on this by-pass bridge approach at Shelton, Connecticut, Mariani Construction Co. was able to hold a 4" wagon drill at top efficiency, averaging 300' per day in shale, *and operate a hand-held drill at the same time.* All Jaeger sizes offer like advantages—more air per dollar, more production per hour.

THE JAEGER MACHINE COMPANY 553 Dublin Avenue Columbus 16, Ohio

PUMPS • MIXERS • TRUCK MIXERS • PAVING SPREADERS and FINISHERS


You owe it to yourself to check
"KOEHRING WORK CAPACITY"
While mechanical features, operating advantages, speeds and capacities are important to excavator and crane efficiency . . . final proof of profit earning value is in *cost per yard moved or ton lifted.* That's why you owe it to yourself to get all facts on "KOEHRING WORK CAPACITY". For specific figures, see your Koehring distributor.
K228
KOEHRING COMPANY
MILWAUKEE 16, WISCONSIN


7¾ TO 79½ TONS
lift capacity
½ TO 2½ YARDS
dipper capacity
KOEHRING
HEAVY DUTY



Preferred power on portable conveyors for economically moving bulk materials! These are the world's most widely used single-cylinder gasoline engines on hundreds of kinds and types of machines, tools and appliances. They are preferred by industry, construction, railroads, oil fields, and on equipment for farms and farm homes.

WHEREVER you find gasoline powered equipment doing the job better, faster — invariably the power is Briggs & Stratton. These single-cylinder, 4-cycle, air-cooled gasoline engines are leaders in the field and preferred for dependable power the world over. Briggs & Stratton Corporation, Milwaukee 1, Wisconsin, U. S. A.

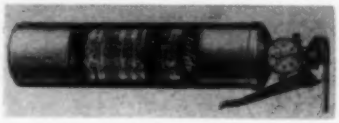
In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

New Equipment

Continued from page 45

The extinguisher is made with all-brass precision construction.

To simplify inspection, cleaning and recharging, the entire valve assembly and pick-up tube unscrew as a unit from the shell. The large valve unit



opening in the dome also serves as the "filler" opening. Special gaskets that resist extremes in temperature, corrosion, and solvents assure a positive, leakproof seal to hold the pressure charge. A visual gauge constantly shows the pressure condition within the unit.

The Model B is approved by Underwriters' Laboratories and is recommended for use on burning liquids, live electrical fires, and also small general combustible fires.

Dynamite Spacers

Manufacturer: Irvington Varnish & Insulator Co., 6 Argyle Terrace, Irvington 11, N. J.

Claims: Plastic tubes used as spacers in dynamite operations have been credited with reducing dynamite consump-

tion by 30%. Maule Industries, Inc., Miami Beach, Fla., made the report.

Maul Industries' work is unique in that all its rock comes from under the water to a depth of about 30 feet where it is impractical to drill by conventional methods. Cut lengths of plastic

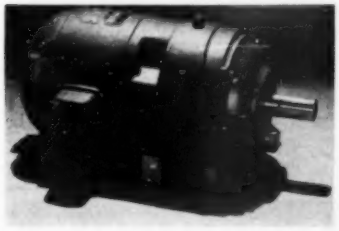
tubing are inserted intermittently with dynamite sticks into a plugged-end pipe which is driven by pile driver action into the rock. Prior to loading with dynamite and spacers, the plug is knocked out of the end of the pipe permitting the water pressure to equalize. After loading, the pipe is withdrawn and a cap is placed in a stick near the top and the charge detonated.

Gear Motor

Manufacturer: General Electric, Schenectady 5, N. Y.

Claims: A new gear motor was designed to simplify maintenance in case of electrical failure of the stator. The new motor is built in three pieces to permit removal of defective stators without disturbing gear components or gear connections to the load. Its design includes a G-E Tri-Clad motor; a compact, planetary gear; and a mechanical adapter.

The gear, developed last year by G-E engineers, is available in speed



ratings of 780 to 13.5 rpm. The mechanical adapter serves the triple function of acting as the pulley end-shield for the motor, the motor end-shield of the gear housing, and a mechanical spacer for easy accessibility to the stator frame bolts.

The stator can be changed with the removal of only bearing-enclosure screws, the bolts that hold the front end-shield to the stator, and bolts holding stator to the motor adapter. A defective stator can be replaced by either another round-frame stator or by an ordinary, standard-motor stator with feet. If a standard stator is used, it is necessary to mount it upside down so its feet do not interfere with the gear motor feet.

In the new three-piece construction, openings for motor ventilation are provided at the bottom. The new motor is available in ratings of 1 to 75 hp for standard applications and up to 200 hp for special applications.

RPM Increase

Manufacturer: Caterpillar Tractor Co., Peoria 8, Ill.

Claims: Increased rpm in smaller engines is announced, as initial shipments of D318, D315, and D311 60 cycle, self-regulating electric sets operating at 1800 rpm begin soon. However, the 1200 rpm electric set will continue to be the standard model.

The D318 standard model electric set has a 12-hour rated output of 45 kilowatts. The modified D318 operating at 1800 rpm is rated at 60 kilowatts. Radiator and fan will limit the modified set to a rating of 59 kilowatts. (Kilowatt output ratings for standard models are based on operation of the complete electric set equipped with radiator and fan.)

Standard D315 model electric set output is rated at 30 kilowatts. At 1800 rpm the rating is set at 40 kilowatts. In the D315, addition of radiator and fan does not reduce the rated output.

Smallest of these three electric sets, the D311, standard model, is rated 21 kilowatts at 1200 rpm. At 1800 rpm it is rated at 30 kilowatts with radiator and fan limiting output to 28 kilowatts. D311 electric sets also will be available to deliver current in single phase voltages at 1800 rpm at 25 kilowatts rated.

Generators are of the self-regulated type and are mounted with belt driven exciter. Flexible coupling drives the rotor which is carried by two ball bearings. Generators for 50 cycle operation and for a variety of voltages are available with the sets.

Truck Crane

Manufacturer: Harnischfeger Corp., 4400 W. National Ave., Milwaukee 46, Wis.

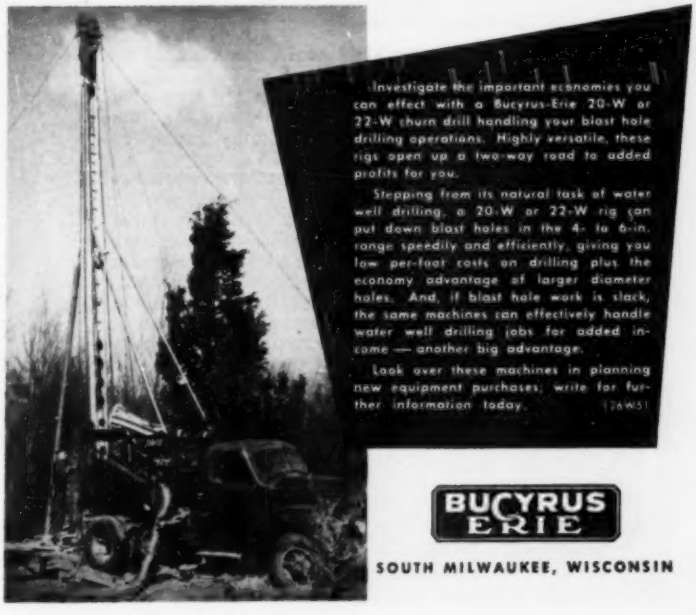
Claims: The "Miti-Mite" Truck Crane makes its bow after more than five years of development and field testing. It is designed exclusively for truck service and is not an adaptation of a crawler excavator. The Miti-Mite

is designed to mount on any truck of suitable capacity.

It is readily convertible for any front end service—shovel, trench hoe, dragline, clamshell, crane and magnet crane. It has a ⅜-cu. yd. capacity as

Get These Advantages

In Your Quarry Drilling Operations


Investigate the important economies you can effect with a Bucyrus-Erie 20-W or 22-W churn drill handling your blast hole drilling operations. Highly versatile, these rigs open up a two-way road to added profits for you.
Stepping from its natural task of water well drilling, a 20-W or 22-W rig can put down blast holes in the 4- to 6-in. range speedily and efficiently, giving you low per-foot costs on drilling plus the economy advantage of larger diameter holes. And, if blast hole work is slack, the same machines can effectively handle water well drilling jobs for added income — another big advantage.
Look over these machines in planning new equipment purchases; write for further information today. 126W51
BUCYRUS ERIE
SOUTH MILWAUKEE, WISCONSIN

shovel and 7-ton capacity as crane.

One of the Miti-Mite's features is its new power box design. This new concept of crane design provides a single, compact box to contain all driving machinery. The full revolving upper is welded integrally as a heavy power box which forms the machine frame and supports all shafts, drums, gantry, engine, counterweight and front end attachments.

A six-cylinder gasoline engine provides power, driving through a heavy-duty 4-speed transmission. Second speed is normal digging speed. All machinery is fully enclosed, running in oil. Antifriction bearings are used throughout. Main drum and swing clutches are of the double shoe internal expanding type with outside cam adjustments provided.

Improved hydraulic controls are listed for the Model 55. These are of the low pressure automotive type and give smooth, positive response. Controls are grouped for the operator's comfort and safety of performance. The full vision cab has an adjustable foam rubber seat with back rest.

Drill Bit

Manufacturer: New England Carbide Tool Co., Inc., Cambridge, Mass.

Claims: One man can drill holes in green concrete, using an electric or pneumatic hammer equipped with the Thunder-Twist carbide drill bit. Thunder-Twist is an improved version of the Thunderbolt carbide drill bit. The bit has two deep spiral vanes which speedily and easily remove dust, putting an

end to packing or binding of bit. This improvement also allows faster drilling in granite and other hard masonry materials. The bit is capable of drilling holes 3/16 to 1¼ inch diameter, up to 36 inches deep. Available lengths are 3, 4, 6, 12, 18, and 24 inches. Special diameters, shanks or extra-length bits can be furnished on request.

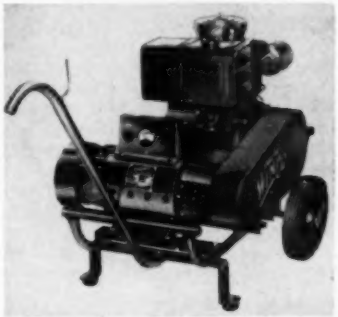
Engine Generator

Manufacturer: Wincharger Corp., East 7th and Division Sts., Sioux City 2, Ia.

Claims: A new portable Engine-Generator, Model 4500, is designed for full output at 115 volts, 60 cycles, alternating current. It has motor starting capacity of 4500 watts—sufficient to start and run motors up to 1½ hp. The unit has 3000 watts intermittent rating and 2500 watts continuous rating.

It operates many portable tools such as cut-off saws, electric chain saws, masonry saws, concrete vibrators or lights. Klixon thermostatic cut-out switches with manual reset protect the generator from overload and overheating. The cast iron outlet box located on the top of the generator provides a voltmeter, and one 20-ampere-capacity and two 15-ampere-capacity twist-lock type outlets wired in parallel.

The Model 4500 is available with either the standard tubular cradle base or "Spedy-Shift" portable base attach-



ment consisting of a single handle and semi-pneumatic rubber tired wheels. The "Speedy-Shift" can be attached in a few minutes to the standard cradle base (no holes to drill), and may be easily removed if required.

The unit is designed for maximum

FASTER, EASIER BLAST HOLE DRILLING

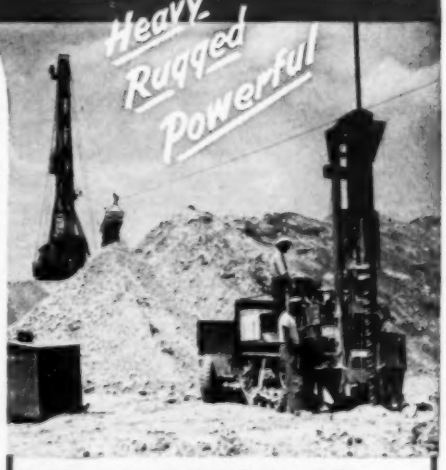
McCarthy Auger Drills

A McCarthy Drill, working eight hours, can keep the big shovels busy around the clock.

Time and again McCarthy Drills get the nod from operating men . . . men who've made actual tests proving that no other equipment can match a McCarthy for speed, stamina and versatility.

At The Bessemer Limestone and Cement Company, Bessemer, Pa., one McCarthy unit averages 90 ft. per hr., working through a facing of blue shale 34 ft. deep. Holes are drilled on 18-ft. centers. Two men handle the whole job, including setup and moving. Another McCarthy unit has been installed in a different section of this quarry and it, too, is breaking all previous records for fast, low cost shot hole drilling. McCarthy Drills operate with all types of power units on all types of mounts. Write today for full facts about this finger-tip controlled money saver.

McCarthy truck-mounted Horizontal Drills keep men and equipment off of the ground, up out of the mud. All McCarthy units are adjustable to necessary drilling angles. Finger-tip controls and six-foot interlocking auger sections provide unlimited drilling opportunity. Self-propelled models also available.



THE SALEM TOOL CO.

773 S. ELLSWORTH AVE.

SALEM, OHIO • U. S. A.

SALEM

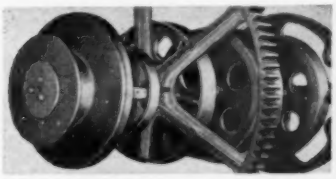
portability with either a Briggs & Stratton No. 23 or Wisconsin No. AEN 4-cycle engine.

Magnetic Tagline

Manufacturer: Osgood Company, Marion, O.

Claims: The development of a magnetic tagline for use on clamshell or electro-magnet services was recently announced.

The new tagline has a drum, mounted on the extension of the hoisting drum shaft, which is provided with a series of "permanent" magnets. By



their magnetic attraction to the flange of the tagline drum, a constant pull is exerted on the tagline rope. Different "pulls" can be obtained by varying the number of magnets on the job.

Important features are its permanency—it requires no adjustment—and no maintenance. The manufacturer calls it an improvement on the track type tagline, or one requiring clutches, springs, and other parts.

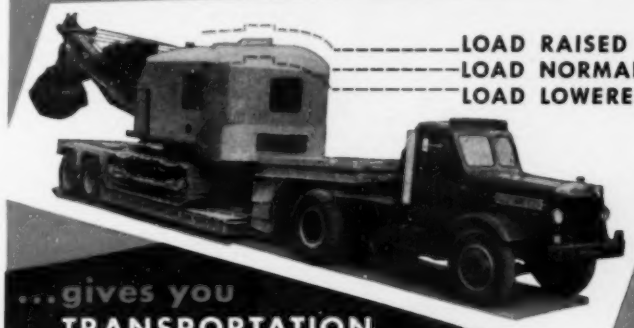
Aluminum Paint

Manufacturer: Paint Corporation of America, Fidelity Bldg., Cleveland 14, O.

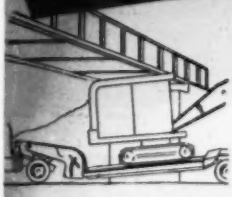
Claims: Known as PCA-102 Aluminum, this new paint is made of doubly pigmented aluminum mixed with a clear base vehicle. The latter is identical to PCA-101 which the company has sold for many years as a clear rust inhibitive. Because of its use of the clear anti-rust base, PCA-102 Aluminum can be applied easily and quickly without any possibility of the base "bleeding" through. The latter is a common difficulty with many aluminum paints that utilize a black asphalt or bituminous base. The clear base also gives PCA-102 a 10% brighter appearance than ordinary aluminum paints. It likewise permits better "leafing" of the aluminum flakes to form a moisture-proof coating.

PCA-102 Aluminum can be applied by brush or spray right over rust without priming, scraping, wire brushing or sandblasting. It penetrates rust layers and seals the base metal against further rust action, and is equally effective as a rust preventive when applied over a new metal surface.

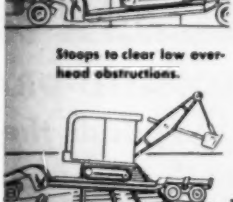
Only ROGERS TYPE "TPG" Power Lift
DETACHABLE GOOSENECK



...gives you
TRANSPORTATION
plus...
LOAD MANIPULATION



Stoops to clear low overhead obstructions.



Raises its deck to clear high banked crossings.

The unique deck raising and lowering feature of this Rogers trailer makes load manipulation a distinct advantage under many hauling conditions.

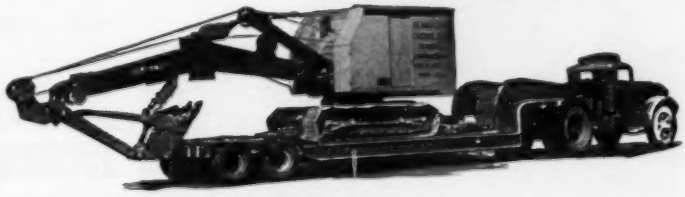
Low bridge or high road bed obstacles are easily overcome. Deck is raised or lowered to alter overall height of load for overhead clearance. Raising deck clears high road beds.

Write for literature and full particulars or call your nearest agent.

THE ROGERS Power Lift DETACHABLE GOOSENECK CAN BE OBTAINED ON ANY STANDARD ROGERS DROP DECK TRAILER

EXPERIENCE builds 'em — PERFORMANCE sells 'em

ROGERS BROS. CORP.
ALBION, PENNA.
136 Orchard Street



A Rogers Type "D" Trailer

Export Office: 50 Church St., New York 7, N. Y., U. S. A. Cable Address: Brositos

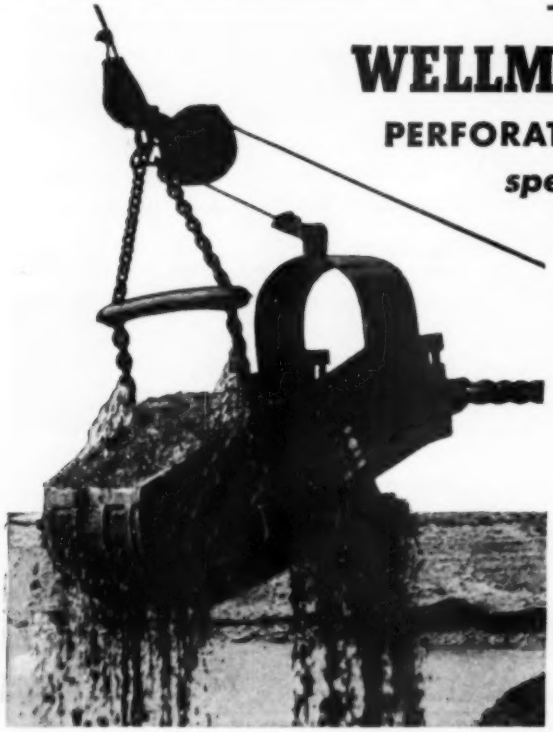
New trade literature

Subject: **Rear-Dump Trucks**
Content: A catalog sheet covering models 1FFD and 4FFD rear-dump Euclids of 34-ton capacity has been released. Twin power is a feature of both models. Side by side Diesel engines of 380 and 400 total hp are employed, each engine driving separate rear axles through torque converters and transmissions. The two models are spring mounted and hydraulic booster steering is standard equipment. The catalog sheet gives detailed specification data.
Where to get: The Euclid Road Machinery Co., Cleveland 17, O.

Subject: **Company History**
Content: Our Latchstring Is Out, is the introduction to a 36-page pocket-size booklet published by Ingersoll-Rand. It presents a brief history of the company, its plants and products and features little known facts about the company. Nearly 100 pictures illustrate products at work. Some of them are: rock drilling; air and electric tools and hoists; air and gas compressors; gas and Diesel engines; centrifugal blowers; centrifugal and propeller pumps; vacuum and condensing equipment and refrigerating units. A little anecdote about Simon Ingersoll and the origin of the first practical steam rock-drill, back in 1871, appears on the back cover. Other Ingersoll-Rand developments are also shown.
Where to Get: Ingersoll-Rand, 11 Broadway, New York 4, N. Y. (Form 300)

Subject: **Dual Drum Paver**
Content: A high-speed Dual Drum Paver is the subject of illustrated bulletin R-1700-B8. In 28 pages the bulletin pictures and discusses crawlers and frames, countershaft and drives, drum rollers, the drum, hydraulic controls, power loader skip, water control, boom swing, boom and boom bucket, and the engine on the model 34E paver. Two pages of specifications and a discussion of auxiliaries are included. Typical of the speed claimed for the new Paver is a boom bucket travel rate of 256 fpm. The power loader skip requires only 6½ seconds to travel from the ground to discharge position of 56° low slope. Transfer from the first to the second mixing compartment also requires about 6½ seconds, depending upon consistency of the concrete. Discharge into the boom bucket is another 6½ second operation. Boom swing is a full 171°. The model retains the exclusive hydraulic bucket, permitting complete control of rate of concrete discharge under all conditions. Increased braking area, more efficient boom raising and lowering machinery, a re-designed drum, and entirely new crawlers and frames are other features of the new machine. The request for the bulletin should be submitted on company letterhead.
Where to Get: Construction Equipment Division, Worthington Corp., Plainfield, N. J.

Subject: **Better Roads Need**
Content: It's Time We Fit Our Roads to Our Need, a 12-page booklet just off the press calls attention to the critical need of new and better roads. Pointing up the serious traffic problem facing the nation, the booklet contrasts the 20 million motor vehicles of 25 years ago to the near 53 million vehicles of today. Little has been done to expand our highway system to keep pace with the growth in traffic volume, the booklet reports. Economic



WELLMAN *Williams Type*
PERFORATED DRAGLINE BUCKET
speeds the wet jobs

• You get big loads fast with this Wellman Perforated Dragline Bucket because excess water goes out while gravel stays in on jobs such as illustrated.

Built of special alloy steel—all welded for strength plus light weight. You can work faster with less maintenance with Wellman dragline buckets.

Want Facts?
Write for free descriptive bulletins.

Dragline, Clamshell, Custom-Built Buckets, Stone and Wood Grabs.

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue • Cleveland 4, Ohio

You can tell by the **PERFORMANCE..**

sure they're "Eucs"!

Wherever they're put to work, "Eucs" do the kind of a job that makes them the preferred equipment for moving earth, ore, rock and coal in off-the-highway service.

Big payloads, fast travel speeds and high job availability add up to more loads per hour and more profit per load. Whatever the job . . . building highways, dams, levees, airports . . . working in mines, quarries or on industrial projects, you can depend on "Eucs" for low cost hauling.

If you own "Eucs" you're already benefiting from their production and profit advantages. If you know them only by reputation, we suggest you get performance facts and figures from your Euclid distributor.

Euclid Scraper—15.5 cu. yds. struck, 21 cu. yds. heaped at 1:1 slope . . . 275 h.p. engine . . . top speed, loaded, 28.2 m.p.h.

Bottom-Dump Euclids—13 to 25 cu. yds. . . . 190 to 300 h.p. . . . top speeds loaded to 34.4 m.p.h.

Rear-Dump "Eucs"—10 to 34 tons . . . 125 to 400 h.p. . . . spring mounted or semi-rigid drive axles . . . top speeds loaded to 36.3 m.p.h.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

CABLE ADDRESS, YUKLID. CODE: BENTLEY

loss from last year's accidents is placed at $3.5 billion—more than was spent on the entire system of highways, roads and streets. Also included is a portion of script taken from the 10th of May broadcast of the National Farm and Home Hour sponsored by Allis-Chalmers Co., Milwaukee, Wis. It tells the story of PAR, Project—Adequate Roads, the organization created recently to spearhead the drive to get us out of today's traffic muddle.

Where to Get: Allis-Chalmers Co., Tractor Division, Milwaukee 1, Wis.

Subject: **Construction Pumps**

Content: A compact bulletin No. 110 describing Carver self-priming centrifugal pumps and diaphragm pumps has just been issued. Along with many illustrations, it contains complete information about each unit as well as capacity tables. These self-priming centrifugal pumps are A.G.C. rated units, 4,000 to 240,000 gph. The diaphragm pumps will handle up to 6,000 gph. Pumps have gasoline engine, Diesel, motor or belt drive and can be mounted on wheels or skids.

Where to Get: Carver Pump Co., Muscatine, Ia.

Subject: **Frost Action in Roads and Airfields**

Content: The literature which pertains directly or indirectly to frost action in soils is voluminous. Articles on the subject are to be found in many publications here and in other countries. Time has not permitted *Frost Action In Roads And Airfields* to be a complete review. However, the review is intended to be comprehensive in scope of subject matter. Soil freezing is treated at considerable length. Some facets of the frost-action phenomenon which have no direct bearing on the design, construction, or maintenance of highways or airfields are covered. The intention of the reviewer, A. W. Johnson, is to give breadth to the concept of frost action, to aid in understanding the effects of soil freezing and thawing on foundations for pavement and structures. The 287-page review is not the normal digest type in which the reviewer would completely restate in his own words, the contents of the literature. Rather, it is an abstract type of review in which the reviewer has attempted to separate pertinent statements and tabulate and classify data and illustrations to make them available to the reader. Writings are summarized in chronological order and a form of referencing permits the reader to know the publication year of the writing. That method permits the reader to follow the development of knowledge and in some instances to observe the changing views of writers with the passing of time.

Where to get: Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. ($3.00—publication No. 211)

Subject: **Power Shovel**

Content: A large "Picture Book" of the Model 255-A Power Shovel has just been published. The 24-page, 2-color bulletin makes liberal use of detailed photos to show design features and the various components of the ¾-cu. yd. machine. Model 255-A easily converts for seven different services: shovel, dragline, crane, clamshell, trench hoe, pile driver and magnet crane. Action shots of these machines at work, plus two pages of plant scenes showing actual manufacturing operations, round out the pictorial content of the book.

Where to Get: Harnischfeger Corp., 4400 W. National Ave., Milwaukee 46, Wis. (Bulletin X71-4)

Subject: **Scraper**

Content: A new bulletin describes the Caterpillar No. 90 scraper. Advantages, specifications, and extra equipment are presented. Nineteen drawings and photographs aid in the description. The scraper has a capacity of 21.2 yards, struck, and 27 yards heaped. Where the material to be handled weighs not more than 2,800 lbs. per cu. yd., top extensions are available which increase capacity to 25.5 yards, struck, and 31 yards, heaped.

Where to get: Caterpillar Tractor Co., Peoria 8, Ill.

Subject: **Mines Register**

Content: The twenty-fourth edition of *Mines Register* has just come off the press. Larger in scope than the 1949 edition, it contains the latest information on close to 7,000 active mining companies in the Western Hemisphere that produce precious, semi-precious and non-ferrous metals. The 772 page book includes such data as: mine location; company history; name and address of company officers and mining personnel; purchasing agents; company capitalization, earnings and dividends for the past few years; a description of mine property, its equipment and production; its ore reserves and the number of men emp'oyed. The 1952 edition also lists more than 40,000 inactive

Continued on page 58

STURDILITE

The HEAVY-DUTY FLOOD LAMP THAT

Lights Your Work Better . . . Gives Longer Service at Lower Cost

Vibration-absorbing Base

Specially Designed for Efficient Service on

Shovels — Excavators — Drag-lines
Roadbuilding Equipment
Locomotive Cranes — Tractors

"BUILT to take it," say users of STURDILITE Heavy-Duty Flood Lamps, after years of trouble-free service. Hermetically sealed-beam lamp—no reflector to become tarnished. Complete assembly mounted on rubber cushioned base that absorbs vibration and shocks. Available in 6-8, 12-16, 24-28 and 110-120 voltages.

COMPLETE BULLETIN, specifications, and quantity prices sent promptly upon request.

Metal Spinning Division
PHOENIX PRODUCTS COMPANY
4723 N. 27TH STREET, MILWAUKEE 16, WISCONSIN

ROCK BOTTOM!

AND READY FOR ANY JOB

P&H MAGNETORQUE* Electric

Swing is 15% to 25% faster than any 2½ yd. shovel

If it's husky strength you want, this is it! Tough all-welded construction throughout to take pounding and shock loads that would K.O. less rugged machines. It means steady digging — less maintenance — down through the years.

If it's speed, you have it with Magnetorque — speed to out-produce any other machine in the 2½ yd. class — with a swing that's 15% to 25% faster. It's the greatest shovel improvement in 20 years. We'll gladly tell you where to see the 955-A working nearest you. Ask today!

If you want larger capacity, ask for facts about the Model 1055 (3½ yd.).

*T.M. of Harnischfeger Corporation for electro-magnetic type clutch.

HARNISCHFEGER
CORPORATION

4400 W. National Avenue • Milwaukee 46, Wisconsin

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES

NOT in the *Contract*

"The Contractors' dinner is next week," said Mrs. Jones. "What color dress are you going to wear?"

"Well," replied Mrs. Smith, "we are supposed to wear something to match our husband's hair, so I'm going to wear black. What would you wear?"

"Gracious me!" exclaimed Mrs. Jones, "I don't think I'll go."

A man is a guy who can spot a trim ankle three blocks away while driving down a busy street at high noon, but who won't notice, in wide-open country, a whistling locomotive the size of a schoolhouse.

The master of ceremonies for a radio quiz, picking contestants from the audience, asked, "Is there a couple here who have been married less than 24 hours?"

A 12-year-old boy brought down the house by piping up: "What would they be doing here?"

Villain: "Ah, my proud beauty, you are in my power at last."

Heroine: "Well, what are you waiting for?"

Youth (to fair companion): "Have you tried listening to music with your eyes shut?"

Voice (from behind): "Have you tried listening with your mouth shut?"

Doctor: "Your husband must have rest and quiet. Here's a sleeping powder."

Wifey: "When do I give it to him?"

Doctor: "Don't give it to him. Take it yourself."

A father called in his young daughter (age six) and explained to her that the gardener had found a lovely little sister for her early that morning among the cabbages. "Now you write to your brother Jack (away at boarding school) and tell him about it."

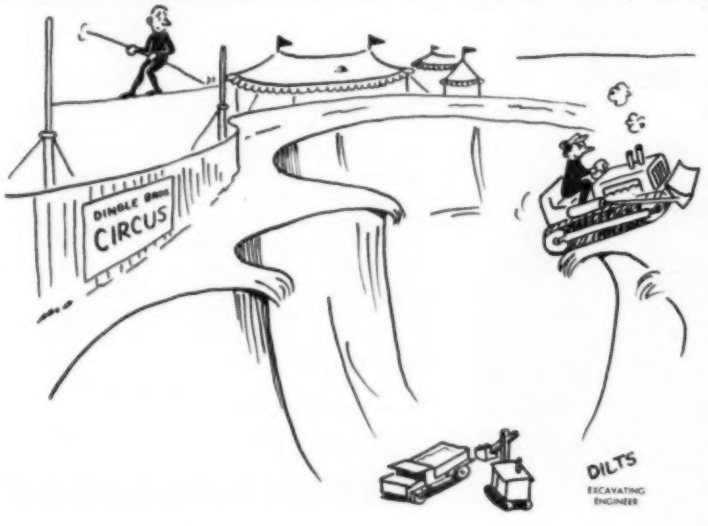
The child wrote the letter and later handed it to her dad to be mailed.

The father was a bit curious and opened the letter. The message read: "Dear Jack, you owe me a buck. It's a girl."

The young wife had listened, with wide-eyed attention, as her husband explained the intricacies of banking and economics.

"It's just wonderful, darling," she breathed, "that anybody could know as much as you do about money without ever having any."

The minister had just finished marrying a plumber and a lovely young thing. When the ceremony was over, the plumber sidled up and whispered in the parson's ear: "I haven't any money, but I can fix your gas meter so it won't register."



Gent (boasting): I want to die with my boots on!

Redhead (purring): Well, put 'em on. Here comes my husband.

A vivacious young Texan shocked her Boston-reared beau by drawing on her gloves as they started down the street on their first date.

"Where I come from," chided the young man, "people would as soon see a woman put on her stockings in public as her gloves."

"Where I come from," retorted the young lady, "they'd rather."

Sandy joined a golf club, and was told by the professional that if his name was on his golf balls and they were lost, they would be returned to him when found.

"Good," said the Scot, "put my name on this ball." The pro did so.

"Would you also put M.D. after it?" asked the new member. "I'm a doctor." The pro obeyed.

"Now just one more thing," went on the Scot. "Can ye squeeze 'Hours 10 to 3' on as well?"

Two chorus girls were looking over a newspaper between acts. "Gee, look, Mame," pointed out one. "It says here that Mr. Adams, the octogenarian, has died. Now, what the heck is an octogenarian?"

"I dunno," replied Mame, "But they're sure a puny, sickly bunch. You never hear about one but what he's dyin'."

A man returned to his office one Monday morning showing the signs of a very strenuous weekend. One of his good friends sauntered over after seeing his friend sitting at his desk with his head buried in his arms.

"How did you spend the weekend?" asked the friend.

"Fishing through the ice," was the sad reply.

"Fishing through the ice? For what?"

"Olives!" was the answer.

Doctor: "You have acute appendicitis."

Wave: "Listen, Doc. I came here to be examined, not admired."

An inebriated man walked into an elevator shaft, fell four floors to the bottom, stood up, brushed himself off, and shouted, "I said UP!"

HOW THE EASTON SIDE-DUMP IDEA CAN MEET YOUR EXACT REQUIREMENTS!

To double your capacity for a long off-highway haul you might want to hitch a dump trailer to a dump truck. How could the front unit dump *except* to the side? It *couldn't* dump any other way!

When the containers dump to the side *any* combination of units is possible. Side-dump *flexibility* lets you plan a haulage fleet to meet your exact requirements, regardless of load, speed, grade or distance. That's why you see so many *different* EASTON side-dump combinations in off-highway service!

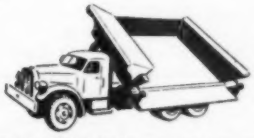
Also, with every EASTON side-dump, you eliminate the need for costly backing and turning at the dumping point. You roll up, dump, and roll on. Your driver *sees where he is going* at all times!

For real haulage economy remember that EASTON side-dumps may be used with any make of off-highway truck or tractor. For specific side-dump recommendations write to the address below.

A FEW VARIATIONS OF THE EASTON SIDE-DUMP IDEA:

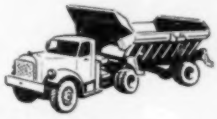
These and other EASTON side-dump combinations, with capacities ranging from 14 to 45 tons, are providing a smooth economical flow of material in mines, quarries and other off-highway hauling operations throughout the world. EASTON engineers will welcome the opportunity to discuss the application of side-dump truck bodies and trailers to meet your specific haulage requirements.

Pan Type Truck Body for shuttle service to a fixed point on grade work against the load.



Drop Door Truck Body hydraulic dump, for versatile all-around hauling, free dumping at any point.

Drop Door Trailer with gooseneck frame, hydraulic dump, for versatile all-around hauling, free dumping at any point.



Pan Type Trailer for big payloads to a fixed point in shuttle service over moderate grades.

Drop Door Truck Body with drop door trailer, hydraulic dump, for big payloads over long hauls. Back mounted body provides extra traction.

Lift Door Truck Body for heavy loads against steep grades to a fixed dumping point.

Pan Type Tandem Trailer for extra large capacity over long distance with fairly level roads.

Drop Door Trailer, hydraulic dump, for big payloads over moderate grades, dumping at any point.

Dual Bodied Trailer, pan type, for big payloads to a fixed point, each body dumping separately.

Drop Door Tandem Trailer, hydraulic dump, for extra large payload, long haul over fairly level roads, dumping at any point.

Pan Type Truck Body with pan type trailer, for large payload to a fixed dumping point with back mounted body providing extra traction.

B-1054

EASTON SIDE-DUMPS

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.

New Trade Literature

Continued from page 54

mines and their location. Statistical data concerning the metal industry is one of the book's special features. Another section covers mining companies whose securities are listed on recognized exchanges. Also included is a comprehensive buyer's guide, listing the various types of mining machinery, equipment and supplies, and the names and addresses of the manufacturers of such equipment. The size of the book is 6 x 9 inches and is clothbound. Editor-in-chief of *Mines Register* is Dr. Joseph Zimmerman.

Where to Get: Atlas Publishing Co., Inc., 425 West 25th St., New York 1, N. Y. ($25.00)

Subject: **A. R. B. A. Publications**

Content: Five new American Road Builders' Association technical bulletins are now available for distribution to members as well as non-members. They are: No. 181, "Experimental Use of Lime For Treatment of Highway Base Courses" by Ernest Zube, senior materials and research engineer California Division of Highways—30c; No. 182, "The Value of Welded Wire Fabric in Concrete Slabs" by Prof. E. W. Carlton, professor of structural engineering department of civil engineering Missouri School of Mines and Metallurgy—25c; No. 183, "Looking Ahead With Soil-Cement in Louisiana" by Fred L. Goodman, engineer Barber Bros. Co., contractors and engineers, and "Reconstruction of Lubbock, Texas, Airport With Soil-Cement" by R. L. Oldham, director of public works, Lubbock, Tex.—25c; No. 184, "Developments in Iowa's Secondary Road Soil Stabilization" by L. M. Clauson, director of secondary road surfacing problems, Iowa State Highway Commission—25c; and No. 185, "Lime Stabilization in District 14, Texas Highway Dept." by H. C. Carter district construction engineer, Texas State Highway Department—25c. Also issued is the 1952 edition of the pocket-sized directory of *Highway Officials & Engineers* which lists administrative engineers and officials of the 48 state highway departments, the District of Columbia and the Bureau of Public Roads. This comes to a total of 1,600 names. The new edition also contains a tabulation by states showing highway mileages constructed and their costs during the past year, as well as an estimate of expenditures and mileages to be constructed during the current year. The directory is priced at $1.00.

Where to get: American Road Builders' Association, International Building, Washington 4, D. C.

Subject: **Asphalt Paving Plant**

Content: A catalog-bulletin describing The Little Monster, a portable asphalt paving plant, is now offered. A brief description, specifications and photographic illustrations of the essential features of the mixing plant are covered. The power requirements of The Little Monster consist of a GM Model 4031-C Diesel engine with 1.76 to 1 ratio gear reduction, developing 92 hp at 1800 rpm or a Caterpillar D 88 X power unit at 1000 rpm. Plant capacity at one minute (charge, mix and discharge) is 30 tons per hour. At 45 seconds (charge, mix and discharge) it is 40 tons per hour. The bulletin notes that the feeding of the aggregate to the asphalt plant is one of the most important factors in providing uniform product quality and production capacity. The feeding device provided for The Little Monster asphalt plant consists of a two-compartment bunker, chargeable by the means of a medium sized front end loader. Located immediately adjacent to the cold stone elevator tail sections, each bunker compartment, equipped with a simple reciprocating plate feeder discharges the aggregate to the elevator via a short chute. The two feeders are controlled by a clutch and driven by sprockets and chain drive from the elevator drive cross shaft located on the main frame of The Little Monster. Adjustable control gates regulate by a simple jack screw, the amount of material fed to either dryer. Bin capacity (level-full) is 6,500 lbs. Weigh box capacity (level-full) is 23 cu. ft. Asphalt bucket capacity (level-full) is 30 gals.

Where to Get: Madsen Iron Works, Inc., P. O. Box 589, Huntington Park, Calif.

Subject: **Heater and Booster**

Content: A new four page bulletin, Form AD-104, features the "Deuce"—a combination tank car heater and pumping booster. With the "Deuce," the bulletin explains, it is possible to raise penetration asphalts, tars and other materials to the required high application temperatures, and deliver the material from the tank car to distributor, transfer truck, or storage tank. The unit heats and transfers material through the direct oil fired pumping booster. Both available models are illustrated — the mobile trailer mounted unit and the skid mounted unit designed for truck mounting or stationary installations. Features and advantages are listed, and the four pass construction of both booster and heater units are illustrated by means of cutaway and sectional views. Included in the bulletin are complete unit specifications. Also illustrated is the method by which the "Deuce" can steam preheat one car to pumpable consistency, while circulating and heating a second car to application temperature.

Where to get: Cleaver-Brooks Co., Road Machinery Div., 326 E. Keefe Ave., Milwaukee 12, Wis.

Subject: **Index of Literature**

Content: Bulletin Index 100-A is an index of technical literature. It consists of both a numerical listing and alphabetical cross index for specification sheets, instrumentation data sheets, catalogs and other literature. Included in the alphabetical index, are articles from *Instrumentation*, the manufacturers quarterly publication.

Where to get: Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Station 40, Wayne and Windrim Aves., Philadelphia 44, Pa.

on the world's
BIGGEST
wire rope jobs...

experienced riggers demand
GENUINE
CROSBY CLIPS

Drop-forged, hot-dip galvanized wire rope fasteners
• SIZES FOR ALL WIRE ROPE •
DISTRIBUTORS EVERYWHERE

AMERICAN HOIST & DERRICK CO.
ST. PAUL 1, MINNESOTA

Get Better Bit Heating Service with this *New Style* Oil Fired Furnace

A real one-two punch for top bit production — heating bits in a Model 4554 furnace, for redressing in the No. 12 bit dresser at the right. This picture was taken in the machine shop of a Minnesota mining company.

If you're a mine or quarry operator looking for high production of dressed bits, you'll find Bucyrus-Erie's newest bit heating furnace (the Model 4554) will fill a definite need in your bit dressing shop. This unit, fired by two double atomizing oil burners, will not only heat your drill bits for redressing more efficiently and at lower cost, but will also prolong their life. Here are a few of its important features:

Individual Preheat and High Heat Chambers for two-stage heating of bits. Two preheat chambers (approximately 1500° F) provide slow heating of cold bits and reduce danger of rupturing the steel. After adequate preheating, the bit is placed in the high heat chamber (2250° F) where it is heated rapidly — the result of the high velocity of hot gases surrounding the bit.

Uniform Bit Heating because the whirling action of hot gases on the bit provides rapid heat transfer while applying equal heat from all sides. There is no need for operator to turn bits in the furnace.

Controlled Furnace Atmosphere keeps decarbonization of the bit steel at a minimum. Three factors make this possible:

1. Adjustment of the air-oil proportioning valve permits a selection of air and oil ratio to attain a non-oxidizing atmosphere in the furnace.
2. The double atomizing oil burners thoroughly atomize the oil to assure complete combustion.
3. Gas pressure inside the furnace is slightly higher than atmospheric pressure to seal out external air.

WHY not investigate the many other money-saving advantages that this new style furnace holds over older oil fired types? Write us today for complete details — and ask for a copy of bulletin BF-1.

203A52C

BUCYRUS ERIE

South Milwaukee • Wisconsin

Notes from the manufacturers

Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has awarded contracts for construction of a new, modern, one-story fireproof building to house the Kansas City branch now located at 1224 W. 12th St. Knoop Construction Co., Kansas City, Mo., has been named general contractor, and Sharp and Simon of Kansas City are the architects. The new branch will be located on twelve acres of land two miles south of Independence, Mo. The new building will be a brick and concrete structure with a machinery storage area of approximately 27,000 square feet. The parts department will utilize 23,000 square feet and the office about 10,000 square feet. When in operation the new Kansas City branch will require a staff of 50 to 60 people. It will serve 125 agricultural and industrial dealers in Kansas, Missouri, and Arkansas.

American Bosch Corp., Springfield, Mass. announces the appointment of the following service agencies for their fuel injection equipment: Auto-Plane Electrical Service, Tucson, Ariz., The Jervis Co., Los Angeles, Calif., Grady Motors, Gairo, Ga. and Diesel Engineering & Equipment Co., Inc., Ford, N. J.

NEWCO WIRE ROPE
CLAMP
AND THIMBLE
..the heavier the load, the tighter it holds!
Pat. No. 2600417 Pats. pend. in other countries.
● NO SLIPPAGE
● 9 SIZES TO FIT WIRE ROPES FROM ¼" TO 1"
● DEVELOPS 85 TO 90% ULTIMATE ROPE STRENGTH (95 to 100% Catalog List)
The strongest and most efficient attachment for wire rope. Made of permanent castings with standard replaceable bolts and nuts. NO WRONG SIDE—threads either way. Easy to install and never needs lubricating.
See your distributor or write direct to
NEWMAN MFG. & SALES CO., Inc.
Dept. E-11 Box 5939, Kansas City 2, Mo.

Caterpillar Tractor Co., Peoria 8, Ill., announces the following appointments: Delmar R. Lammers as service manager to assist in general service administration; Merle W. Dargel succeeds Lammers as eastern division service manager; and Theodore M. Fahnestock succeeds Dargel as service engineering manager. Lammers joined Caterpillar and entered its service department in January, 1946, following his discharge as lieutenant after four years of Navy duty. He gained prewar service experience with two Caterpillar dealers in California—Weaver Tractor Co. of Sacramento and Peterson Tractor & Equipment Co. of San Leandro. Dargel also entered the service department in 1946 following his release from the Navy, but he had been with Caterpillar since 1937. He advanced from service staff engineer to service engineering manager in 1950, his most recent post. Fahnestock recently returned from Germany and was placed on inactive duty as a captain with the 403rd Engineer Base Depot. He now is resuming his managership of the service engineering division, interrupted when he was recalled to the service in 1950. A Caterpillar employee since 1931, he also served 3½ years in the Army Ordnance Dept. during World War II. Caterpillar Tractor Co. also announced that Schultz Machinery Co., Bismark, N. D., has assumed distributorship for Caterpillar products in the western portion of the state. The new company is headed by Percy Schultz, president and general manager, who shares ownership with C. H. Schultz, vice president; Wilbur D. Schultz will actively head up the parts and service activities, and Harley J. Faken will be secretary-treasurer. C. J. Beck has been appointed sales manager of the new firm and Byron J. Kluesing has been named to manage the branch office at Minot.

Continental Motors Corp., Muskegon, Mich., is carrying out its most important field expansion move of recent years at East Point, Ga., industrial suburb of Atlanta. Continental is building an office and warehouse headquarters which will provide the company, for the first time, with such a facility in the southeast. The building, a single-story structure of brick, with limestone trim, covers some 20,000 sq. ft., utilizing a small part of the 5⅓-acre tract which the company bought recently with this and future expansions in mind. Plans call for completion of the building for occupancy Aug. 1, 1952. This new facility, is designed to assist customers by making available to them, for prompt delivery, industrial engines, power units, and parts. In charge of the Atlanta Branch is L. J. Holland, who has been with Continental since 1942. A graduate of the University of Illinois, Holland has served the company successively as a field representative contacting the armed services during World War II, an aircraft division sales representative on the Pacific Coast, and assistant manager of the aircraft division in Muskegon, the post he now leaves.

Davey Compressor Co., Kent, O., has organized Davey International, Inc. to handle export sales of air compressors and truck equipment in the western hemisphere. The new company will be a wholly owned subsidiary and will operate in Central and South America, Mexico, and the West Indies. In addition to supervising the sale of portable, truck-mounted, and industrial stationary compressors it will handle heavy-duty power take-offs for trucks, portable light and power units, mobile machine shops, and field service units. Sales manager of Davey International, Inc. will be F. C. Kieser, who has been export manager of the Davey Compressor Co. for the past three years. A mechanical engineering graduate of the University of Hamburg, Germany, Kieser was associated with Mater-Werk, Frankfort, for ten years prior to the war.

Gar Wood Industries Inc. has named F. Eugene Englander sales manager of the Richmond division, Richmond, Calif. A native of San Francisco, Englander attended the University of California and Ohio State University. After serving as an administrative assistant of production control for Curtis Wright in Columbus, O., he was employed as western states sales manager of the Golden State Sales Corp. He joins Gar Wood from Oscar Krenz, Inc., Berkeley, Calif. where he was sales manager. In his new position, Englander will direct all sales activities for the products manufactured and sold by the Richmond division, including hoists and dump bodies, side dump rock bodies, Hi-

Lift loaders, winches, pole derricks, truck cranes and Loadpacker refuse collectors.

Goodyear Tire & Rubber Co., Akron, O., has named J. L. Reid district manager of mechanical goods sales at Salt Lake City, replacing W. T. Roberts, who retired the 1st of July after 32 years' service. Reid was serving in Salt Lake City as a field representative, mechanical goods, when the appointment was announced. He joined the company's aircraft division in Arizona in 1942. He entered the sales field as a mechanical goods trainee in 1949 and was a field representative at Phoenix, Ariz. until 1951 when he was transferred to the Salt Lake City district. Roberts was with the mechanical goods division in the northwest from the time he joined the firm as a trainee in 1920. Locating in Denver, Colo., he worked as a plant analyst, and was later in mechanical goods sales at Salt Lake City, Butte, Mont. and Seattle, Wash. Reid is a native of Prescott, Ariz. and attended University of Arizona, Curtis Wright Technical Institute and California Institute of Technology.

Joy Manufacturing Co., Pittsburgh, Pa., has appointed Florida-Georgia Tractor Co. of Miami as distributor for southern Florida. Florida-Georgia maintains sales and service facilities at 3139 N. Miami Ave., Miami, Fla. and employs a 25-man staff. This new dealership covers the entire Joy construction line, which includes stationary and portable air compressors, rock drills, paving breakers, spaders, tampers, and portable hoists.

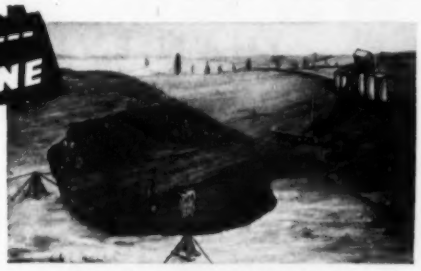
Motorola, Inc., Chicago 51, Ill., has announced the June 1st opening of a new west coast parts and service department. This new activity will be headed by John Jipp, former sales manager of the division's southwestern states region. Establishment of the new department offering parts and repair service to a nine state area will give customers and authorized service stations the same service now available east of the Rockies. The new office, located at 811 S. B St., San Mateo, Calif. is equipped to handle parts and service on 2-way radio installations, microwave systems, power line carrier equipment, telemetering equipment, and remote supervisory control installations. Jipp became associated with Motorola as a sales representative in 1945 after spending four years as a senior radio engineer in the signal corps laboratories in Fort Monmouth, N. J.

Nordberg Manufacturing Co., Milwaukee, Wis., announces that T. D. Davis, as western branch manager of the Crusher and Process Machinery Divisions, will be in charge of the company's entire west coast operation including the northwest territory formerly under the jurisdiction of G. E. "Gunnar" Jarpe. Jarpe was recently transferred to Duluth, Minn., as district manager of the north central territory. Davis will retain his headquarters at the San Francisco Branch Office. He will be assisted by J. W. Crandall and L. O. Makholm, sales engineers.

Phoenix Products Co., Milwaukee 16, Wis., announces purchase of a new welding line—the DryRod Electrode Oven—formerly sold by Philip Roden Co., also of Milwaukee. Although new to its list of products and services, DryRod, it was pointed out, is no stranger to the company's manufacturing and

Continued on page 64

ONE MAN ----- ONE MACHINE



VERSATILE
EFFICIENT
ECONOMICAL

Picture shows how a Sauerman Drag Scraper equipped for rapid shifting makes fast work of cutting down a large hill of hard-packed gravel.

SAUERMAN SCRAPER

Sauerman Scraper stores and reclaims 150,000 tons of crushed stone on space between dock and cement mill.

Operation of a Sauerman Scraper machine is an easy one-man job because of the unique Sauerman roller bearing hoist.

VERSATILE: The Sauerman Power Drag Scraper can be readily set up for almost any dig-and-haul job. The material may be hard-packed, wet or sticky — the haul may be one hundred feet or many hundred feet — the flexible Sauerman Scraper always seems equal to the task. Only one man is required to dig, haul, stockpile or load in one continuous cycle. Bucket sizes ½- to 15-cu. yds.

EFFICIENT: Finger-tip controlled from a safe, comfortable operating station, the scraper is easily guided over a large area. The unique bottomless Crescent scraper readily penetrates hard materials, gathers a full load, hauls to the discharge point, and dumps cleanly and quickly. Depending on the length of the span, 20 to more than 40 loads can be moved per hour.

ECONOMICAL: Labor and equipment is reduced to a minimum by using the Sauerman Scraper. Installation is moderate in cost. Simplicity of design, plus the fact that only the most expendable parts come in contact with the material handled, results in low maintenance. Gasoline, diesel, or electric power consumption is light.

For Complete facts send for Catalog A.

Rope Haulage Equipment Specialists Since 1909

SAUERMAN BROS., Inc.

574 S. Clinton St. Chicago 7, Illinois

NOW...

Fast Smooth Cycle

COUNTS MORE THAN EVER

and it's yours with Bucyrus-Erie Excavators

SPEED is a traditional characteristic of Bucyrus-Erie excavators . . . and speed in the individual dig, swing, and dump operations only tells part of the story.

In Bucyrus-Erie machines, working speed starts on the drawing board, where cycle functions are **balanced** with one another (as well as being designed fast in themselves) . . . and co-ordinated with proper weight distribution. Adding smooth, steady power . . . liberally used anti-friction bearings . . . easy-filling dippers . . . and direct-action mechanical control gives them the overall production speed that has made them the standard of the industry.

Eliminating lost time and waste motion is one big way to boost output wherever excavators are used. Now . . . when that counts more than ever, you can count on Bucyrus-Erie excavators to "deliver the goods."

58E52C

BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin

⅜ to 4-yd. Gasoline, Diesel, Single-Motor Electric Excavators
Hydrocrane
Hydrohoe

Most Compared

BUCYRUS ERIE

Most Preferred

Preventive Maintenance is just one of many important topics covered in a new 32-page booklet — "Ways to Make Your Excavator Work Harder — Live Longer." It's also loaded with valuable hints on lubrication, adjustments, engine care, safety and many other phases of excavator care. Write for your copy now!

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES AND DRAGLINES
1¼ YDS. AND UP

175 Bucyrus-Erie shovel.
75 T.P.H. Jeffrey washer.
450 Marion gas electric shovel.
Truck, motors, etc.
All equipment in operating condition.
Write or call:

G. A. Anderson
Appleton City, Missouri

Bucyrus-Monighan Model 1150-B 25-yd. walking dragline, 180' boom, late model, 4000 volts electric, now operating, prompt release, A-1 condition. Midwest.
Bucyrus-Monighan 9-W diesel walking draglines, 165'-200' booms, 12-yd. buckets (3).
Marion 5480 electric 18-yd. stripping shovel.
Bucyrus 120-B 25 cycle elec. 4½-yd. shovel.
Marion 3½-yd. and 7½-yd. diesel shovels.

H. Y. SMITH COMPANY
828 N. Broadway Milwaukee 2, Wis.

Immediate delivery P&H Model 1400 electric stripping shovel, guaranteed excellent condition, 48 ft. boom, 34 ft. sticks, 3¾ yd. bucket, large inventory of parts.

Harmon Creek Coal Corporation
1606 First National Bank Bldg.
Pittsburgh 22, Pennsylvania
Phone GRant 1-1474

Bucyrus-Erie 75-B shovel in good operating condition. Recently completely overhauled. Priced right. Location West Coast.

Granite Rock Company
Watsonville, California

Page 625 diesel walking dragline. 150 ft. boom, 9 cu. yd. bucket, 4 years old. Good operating condition. Price $150,000. Loaded on cars. Location middle east. Box 3486

•

Page 618 diesel walking dragline. 110 ft. boom, 5 cu. yd. bucket. Machine approximately 7 years old. Good operating condition. $50,000. Loaded on cars. Location Middle East.
Box 3485

SMALL SHOVELS, CRANES AND DRAGLINES
UP TO 1¼ YDS.

¾ yd. clamshell, dragline (less buckets) and dragshovel; Byers Model No. 83; new January 1947. GM3-71 engine, 40' boom, 24" treads. In good operating condition.

J. P. Wetherby Construction Co.
1016 W. Superior St. Ottawa, Ill.
Phone Ottawa 1939

Bucyrus-Erie 37-B diesel shovel and 55 foot boom dragline. New in 1943. Also Bucyrus-Erie 44-B diesel dragline with 60 foot boom. New in 1946. Both machines in good operating condition.

F & S Contracting Company
1300 Chicago Street
Butte, Montana

Insley K-10 full revolving crane, 30' boom, crawler mounted.

Wood Lumber Company
815 N. 13th Street Birmingham, Alabama

Bucyrus-Erie 15-B shovel. Serial No. 24147. This machine has 16" treads, is powered with Buda gasoline engine that has been rebuilt within the last six months, is in good operating condition and can be seen operating any day at Bonne Terre, Mo. Price $6750. For further information, contact:

E. Paul Black
Flat River, Mo. Phone 212-J

BARGAINS
SHOVELS—DRAGLINES

Bucyrus-Erie 22-B ¾ yd.—GMC diesel engine.
Northwest 25 ¾ yd.—GMC diesel engine.
Lorain 41 ¾ yd.—Cat. diesel engine.
Koehring 205 ½ yd.—Int. diesel engine.

R. S. Armstrong & Bro. Co.
676 Marietta St. N.W.
Atlanta 3, Georgia
Phone LAmar 6434

Northwest model 25; 6; 80D; 95. Manitowoc 4500; 4500 new — will rent. Bucyrus 54-B; Monighan 8W; 7W; 9W; 450.

A. W. Nevers Phone 32 Mt. Pleasant, Iowa

SHOVELS - CRANES - DRAGLINES

We specialize in used late model machinery of all types and sizes, including Northwest, Bucyrus-Erie, Koehring, Lima and Lorain units. All machinery in sound operating condition. Complete attachments for above available.

SALES Reasonable Prices RENTALS
J. C. French, 226 Berry Pkwy., Park Ridge, Ill.
Tel. TAlcott 3-4927

MISCELLANEOUS EQUIPT.

5
HEILINERS
at a RIGHT Price

Tractor Model 2C800 with 200 HP Cummins Diesel Engines Scrapers Model C16—Cap. 13.1 struck to 16 heaped. Brand new tires 24.00 x 29-24 ply. Five units available—all in excellent condition.

Price Each $20,500.00

also

4 EUCLID
BOTTOM DUMP WAGONS

Model 25FDT Capacity 13 to 17 cu. yds. with 165 HP Cummins Diesel Engines. Reconditioned, ready to roll.

Price Each $12,500.00

H. O. PENN MACHINERY CO., INC.
140th St. & East River
New York 54, New York
CYpress 2-4800

Shovel-front end equipment complete for Bucyrus-Erie 22-B. Used only two weeks. Located at Coldwater, Michigan. Priced reasonably.
Box 3491

USED EQUIPMENT

BUCYRUS-ERIE Model S-90, 4-wheel 8 to 10 yd. scraper.
ALLIS-CHALMERS Model HD-14C tractor with Gar Wood hydraulic control unit.
ALLIS-CHALMERS Model AD motor grader powered by a GM 3-cylinder engine.
CATERPILLAR Model D-8 tractor with LaTourneau cable tip dozer.
For further information, contact

E. F. CRAVEN COMPANY
Phone 3-5521 P.O. Box 538
Greensboro, N. C.

Continued on page 64

For Sale

Continued from page 63

PAVER BARGAIN

IMMEDIATE DELIVERY

MultiFoote Model 34-E
Dual Drum Concrete Paver

CURRENT MODEL
COMPLETELY REBUILT

Equipped with 35' boom, 60" bucket, electric starter, large water tank and pump. Hercules gas engine.

Price $24,000.00

H. O. PENN MACHINERY CO., INC.
140th Street & East River
New York 54, New York
Tel. CYpress 2-4800

May We Help You?
If you do not find the equipment you want listed in these columns, write to:
Excavating Engineer
South Milwaukee Wisconsin

WANTED

WANTED: 4-yd. lightweight Sauerman Crescent Scraper. Box 3490

Wanted: Used gold dredge with 6000 cu. yds. capacity per 8 hours and digging deoth of about 30 feet. Write giving price and location. Box 3488

Wanted: Oversize caterpillar mounting for Bucyrus-Erie Model 44-B. Box 3489

HELP WANTED

Position vacant. Superintendent: Man familiar with open pit mining with bulldozer, scraper, shovel, for New Caledonia. Some knowledge of French preferred. Must be able to teach operators. Liberal pay and bonus. Box 3487

POSITION WANTED

General superintendent or superintendent available: 30 years experience and qualifications; supervising, estimating, and building all types highways, airports, heavy excavating, large sewers, earth-filled dams, levies, covering several states. Honest, sober, and reliable, know cost and equipment. Interpret plans and organizing. Box 3464

Position wanted as shovel, dragline, clamshell or pile driver operator. Have operated gas, steam and diesel large and small machines. Prefer steady work. P. O. Box 8, Hurricane, West Virginia. Phone 4403-Hurricane.

If you are Buying or Selling Used Equipment this is the place to let the Excavating Industry know about it.

Notes

Continued from page 61

research departments. Phoenix engineers were active in the original design and development of this pioneer electrode oven, and have always handled the manufacture of DryRod for the Roden Co. It was only recently, however, that complete ownership of the product, including sales and merchandising rights, was acquired. The company points out that DryRod may be the industry's answer to the costly rework and scrap loss problem in high-strength welds. Designed to preserve mineral-coated (low hydrogen type) electrodes from the damaging effects of normal shop moisture pick-up, DryRod's thermostatically-controlled electric oven employs circular design for uniform heat distribution.

Sterling Division, White Motor Co., Milwaukee 1, Wis., has named Lee E. Copple sales manager of the Construction and Mining Equipment Dept. Copple has been off-highway tire sales manager for the Firestone Tire and Rubber Co., Akron, O. He previously had been merchandising manager for Von Hamm-Young Co., Ltd., Hawaii, and district manager for Firestone in Hawaii. He served in the U. S. Army from 1942-45 and is a graduate of Nebraska University.

Twin Disc Clutch Co., Racine, Wis., announces the appointment of Donald E. Beaton as assistant general manager, hydraulic division, Rockford, Ill. The new position occupied by Beaton was created as part of the overall expansion program of Twin Disc, including the current $1 million expansion at the Rockford plant. Beaton has been associated since 1936 with Thompson Products, Inc., Cleveland, O. He has been factory manager of Thompson's Accessories Division for the past six years. With a background of precision manufacturing and large scale production, Beaton has concentrated his experience in the field of hydraulic power transmission mechanisms as produced for the aircraft industry, and in the new techniques which will be used in the manufacture of the new Twin Disc two-stage hydraulic torque converters. Born in Cleveland in 1911, Beaton holds a B.S. degree in administrative engineering from Cornell University, and an M.B.A. in industrial engineering from Harvard graduate school of business administration.

Worthington Corp., Harrison, N. J., at the annual meeting re-elected their present board of directors and voted to change the company's name from Worthington Pump and Machinery Corp. Because of wide diversification the company believed that the continued reference to "pumps" in the corporate name tended to imply that pump manufacture was the only endeavor. No policies or practices will be affected in any way by the name change. Although Worthington is a leading manufacturer of pumps, a major portion of its sales volume is in products such as air and gas compressors, Diesel and gas engines, air conditioning and refrigeration equipment, steam power generation apparatus, electric motors, generators, and switch gear, V-Belt transmission drives, construction equipment, and liquid meters. The company's billings for 1952 are expected to be substantially in excess of last year's $119,780,372.

MORE EFFECTIVE SHOTS

you can plan your shots better when you "Hook up and Detonate with PRIMACORD"

Using Primacord you get faster, easier loading; the positive firing of every dynamite cartridge in every hole – be they wet or dry; the shooting of as many holes as you wish; the most efficient use of your men and mobile equipment regardless of the terrain or the weather. And correctly hooked up, you can shoot the front holes a split second ahead of those behind, giving you relief from burden and better fragmentation. All of which means easier digging, larger daily yardage.

Your men will like it, too. It's less hazardous – it cannot be set off by friction, sparks, ordinary shock or stray electrical currents . . . yet it fires instantaneously from a blasting cap.

***Plan your shots for bigger payloads with* PRIMACORD**

Ask your explosives supplier or write us direct for further facts

THE ENSIGN-BICKFORD COMPANY
SIMSBURY, CONNECTICUT
Also Safety Fuse since 1836

There's a type for every job. **PLAIN PRIMACORD** for shallow holes and surface trunk lines; **REINFORCED PRIMACORD** for deep holes and resistance to abrasion, **WIRE COUNTERED PRIMACORD** for deep, ragged holes; and **PLASTIC REINFORCED PRIMACORD** for deep holes and unusual wet conditions.

Use PRIMACORD®

The PROVED and APPROVED DETONATING FUSE

Does your *protection* extend to wire rope when schedules are tight?

Wire rope that combines strength, flexibility and ease of handling belongs in the category of safety equipment. These qualities are bred into Preformed Yellow Strand. But look to this long-lived rope, too, for help in warding off intangible hazards. When you are pressing to beat a deadline or protect a narrow margin, top-grade steel wires and skilled engineering will be working on your side: resisting premature replacement . . . keeping production high . . . holding job costs in line. Say the word and one of our wire-rope engineers will gladly check your installations.

BRODERICK & BASCOM

Yellow Strand®

PREFORMED WIRE ROPE

Broderick & Bascom Rope Co.
St. Louis 15, Mo.

Branches:
New York, Chicago, Houston, Odessa, Tex., Los Angeles, San Francisco, Portland, Seattle

Factories:
St. Louis, Peoria, Houston, Seattle

Distributors in All Industrial Centers